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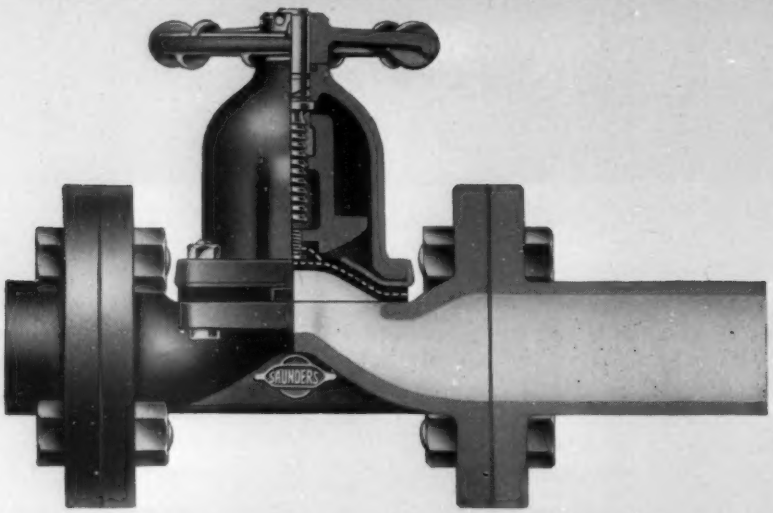

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IRON AND COAL
TRADES REVIEW

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Private Enterprise Plus

REASON given most often by those who advocate nationalization of steel is that the industry is of such vital importance to the nation that it should not be left in the hands of private enterprise. They forget—perhaps conveniently—or they ignore the existence of the Iron and Steel Board, which was set up for the express purpose of ensuring that in the operation of the industry the interest of the nation is at all times kept to the fore. The aim of the Iron and Steel Act of 1953, which set up the Iron and Steel Board, is to combine private enterprise with public accountability. Private firms compete against each other under the supervision of an independent statutory authority charged wtih the duty of exercising "a general supervision over the iron and steel industry . . . with a view to promoting the efficient, economic, and adequate supply under competitive conditions of iron and steel products."

These facts, well known to iron and steel manufacturers, are not well known outside industry—indeed, it is doubtful if the men employed at the blast furnaces and steelworks are fully aware of them. Get one of the British Broadcasting Corporation's peripatetic questioners to stop passers-by in the High Street of any town—Middlesbrough or Morecambe, Corby or Crawley, Sheffield or Surbiton—and ask, "Are you aware of the existence of the Iron and Steel Board?" and how many truthful affirmative answers would he get? Possibly one in 10. Add to the question, "What is the function of the board?" And it is unlikely that more than one in 100 would reply intelligently. Their ignorance can be enlightened by a study of a booklet, "The Iron and Steel Board: What it is and what it does," just published by the board. It is being widely circulated in industry and also to Members of Parliament, Government departments, the economic faculties of universities, and to libraries. We hope that the facts that it contains will percolate through to a wider public. The main facts are worth repeating here.

In the first place, the Iron and Steel Board is not a Government department, but its members are appointed by the Government and its periodical reports are submitted to Parliament. It is financed not by the Government, but by levies which it has power to make on the industry. It does not own the industry or any part of it. It is not in the main an advisory body, but a statutory authority with specific responsibilities and the power to carry them out. Its concern is with the public interest, not with the sectional interest of producers and consumers as such, though it obviously takes these into account against the background of general economic conditions. For the most part the board must consult the persons and representative organizations concerned. "In fact," say the booklet, "it relies largely on discussion and persuasion to achieve its objectives." But it has the powers and the sanctions it needs to carry out the duties laid upon it.

What are these duties? The board must keep under review the productive capacity of iron and steel producers, the prices charged for iron and steel products, the supply and distribution of raw materials and fuel, and arrangements for promoting research, training, and education and the safety, health, and welfare of the employees in the industry, and for joint consultation between management and workers on matters other than terms and conditions of employment.

The board's independence is illustrated in its membership. Two members are full-time, and neither of these may have a substantial financial interest in the steel industry. At present there are 10 part-time members: three are from the trade union movement and three from the steel consuming industries; two are steelmakers: one is experienced in the ironfounding industry, and one has had much experience of research and development work. The part-time members do not represent special interests, but contribute specialized knowledge and experience to the board's consideration of the problems before it.

How has the board discharged its duties since it was established in 1953? One of the most important of its responsibilities is the supervision and, if it judges this advisable, the control of prices. It has authorized during its life both increases and decreases in prices. In its first comprehensive review of prices (in 1954) it followed the general principles adopted by earlier price-fixing bodies, *i.e.*, maximum prices were based on (*a*) the average cost of production of each product of the more efficient producer, plus (*b*) a margin for depreciation and obsolescence of plant at replacement cost, plus (*c*) a margin for profit based on the historical capital employed. Such a policy might not, however, reflect quickly enough the possible reduction of costs resulting from new technical developments, or offer enough incentive to expansion by providing a reasonable return on new plant at a time of rising costs, and it has since

been discarded by the board. Now, price policy is geared more to production costs and capital charges at a completely new plant. Something like an ideal plant is created on paper, and the board fixes prices to cover the operating costs, and reasonably remunerate the capital cost, of the hypothetical plant. Prices are not fixed until technical experts have been given a chance to make sure that the board's assessments are not unduly stringent. The technical estimates involved must necessarily leave some room for difference of opinion, but it is the board's view that a more exact knowledge than ever before has been gained in the field of cost economy. Apart from their function in price-fixing, the estimates of new-plant costs are increasingly used by producers themselves as a yardstick in their development projects.

Running alongside price policy rather than preceding or following it in importance, is the duty the Iron and Steel Board has of keeping under constant review the productive capacity of the industry. In this it has the unenviable task of gauging future demand. The board has authorized the expenditure of vast sums of money to ensure that enough steel has been made available to meet the demand and that the industry's plant has been kept in line with modern technological developments. The cynic may retort that in the expanding national economy that has come to be taken for granted since the war this calls for neither prescience nor enterprise, but in fact it has at times required courage of no mean order. There have been periods of shortage and shorter periods of plentitude in steel supplies, but over the years a close balance has been struck, and today we have a steel industry which is meeting a vastly expanded demand for its products and is geared to make a still greater contribution to world steel supplies in the future.

In its admirable booklet the Iron and Steel Board confines itself to facts, designed to help everybody interested in steel to understand its work. It makes no claims, lists no achievements, on its own behalf or those of the industry. It could claim many successes. The steel industry and the nation have been served well by the Iron and Steel Board. It has proved beyond doubt that private enterprise can be effectively combined with public supervision, to the profit of the community —and, we would like to add, to the satisfaction of of the electorate.

LAND FOR A FACTORY at Brantford, Ontario, has been acquired by Renold Chains, Limited, precision chain engineers, of Wythenshawe, Manchester, which has established a new manufacturing subsidiary in Canada. The operation is designed to support expanding sales of the company's products marketed by the sales subsidiary, Renold Chains Canada, Limited.

Passing Thoughts . . .

KNOCK on the doors of your friends in industry throughout the country and persuade them of the value and the fascination of the export trade . . . We have always been merchant venturers in this island. That is our tradition and I ask you to recruit from these noble ranks on the best basis and with all the energy at your power.—The Prime Minister speaking in London to 400 representatives of industry and commerce.

> *Exports have to be sold; actively, aggressively, and expensively . . . Exporting is a "joy" only by accident. Essentially it is business, and needs proper conditions for success. What exporters and prospective exporters are entitled to ask is whether the Government will back up its campaign by doing more for them. If so, what?—Daily Telegraph.*

So far as we are concerned what is "really wrong" [in exporting] is simply lack of steel. A few months ago we wrote to over 250 firms of steelmakers, steel merchants, and steel stockholders, but only one firm was able to help us and in that case the quantities offered were small and the deliveries spasmodic. The consequence is that we have thousands of pounds worth of export orders on hand dating from October last which we are unable to deliver owing to lack of steel. We have incurred heavy expense in forging larger sizes of billets down into the sections and sizes of steel required for our specialities, but we cannot obtain these larger sizes of billets in sufficient quantities to keep our workmen in full employment. It is disheartening to a degree, but like the Israelites, unless we are provided with straw we cannot make bricks.—MR. THOS. H. JAMESON, chairman and managing director of Hardypick, Limited, Sheffield, in a letter to The Times.

> *It is not the lack of enterprise that stops many smaller companies from selling overseas, they simply have not got the time nor the staff to carry out this complicated procedure.*—MR. I. A. CURRY, *chairman of the Weir Electrical Instrument Company, Limited, in a letter to The Times.*

Uncertainty afflicts and inhibits some people, but their timidity is hardly justified or useful. There has seldom if ever in the world's history been a time when existence was not in some degree precarious, yet the right response to danger lies in action. The task of science is therefore clear. It is to go ahead undeterred by any of the uncertainties.—SIR CYRIL HINSHELWOOD, president of the Royal Society, at the opening of its tercentenary celebrations.

Fairey Bids £1,365,000 For Siebe, Gorman

OFFER to acquire the 1,200,000 issued 5s. shares of Siebe, Gorman & Company, Limited, manufacturers of breathing and diving equipment, etc., of Chessington (Surrey), has been made by the Fairey Company, Limited. The offer is 22s. 9d. per share, totalling £1,365,000. The directors of Siebe, Gorman intend to accept in respect of their own holdings which, together with family interests, exceed 50 per cent of the issued capital.

Siebe, Gorman will continue to maintain a separate identity after the acquisition.

UK Steel Exports

HIGH RATE FOR FIRST HALF OF 1960

ESTIMATES for 1960 of the Iron and Steel Board include a provision for steel exports of 4,400,000 ingot tons. Exports in the first five months of the year were at this rate and give grounds for expecting that the estimated total for the year will be reached. If so, the board states, it would represent a considerable gain over 1957, the best post-war year, and would be highest annual total on record.

The high rate of exports this year is largely the result of increasing trade in plates, heavy sections, and tinplate. Exports of plates and heavy sections have been at a rate more than twice the 1957 figure, and tinplate has shown a gain approaching 40 per cent. Exports of products such as sheet and ferro-concrete bars have been affected by the greater pressure of home demand in 1960, compared with 1957.

Reviewing the provisional returns of steel and pig-iron output for June and the figures for the first six months of the year the board comments that the credit restrictions introduced by the Government have not yet made any noticeable impact on the home usage of steel, or on the tendency which has been in evidence since last autumn for users to rebuild their stocks. The substantial order-books which exist for most steel products suggest that there is unlikely to be an early effect on steel production.

Comparative Rates

The annual rate of UK exports of steel achieved in the first five months of the year and the annual rates for 1959 and 1957 give interesting comparisons. For the principal products they are as follows:—Plates, 421,000, 277,000, and 206,000 tons; heavy sections, 399,000, 296,000, and 193,000 tons; tinplate, 598,000, 487,000, and 435,000 tons; sheet, 409,000, 376,000, and 528,000 tons; tubes, 651,000, 610,000, and 634,000 tons; light sections, 226,000, 195,000, and 220,000 tons; ferro-concrete bars, 34,000, 53,000, and 88,000 tons; wire rod, 62,000, 49,000, and 55,000 tons; strip, 100,000, 84,000, and 85,000 tons; railway material, 190,000, 173,000, and 363,000 tons; billets, etc., 49,000, 84,000, and 12,000 tons; totals, 3,139,000, 2,684,000, and 2,819,000 tons. The ingot equivalent is 4,400,000, 3,700,000 and 3,900,000 tons.

Comparative figures for the supply of and demand for steel in 1959, with the 1960 estimates in parentheses, give the following results:—Production, 20,200,000 (24,300,000) tons; imports and reusable steel, 800,000 (1,700,000) tons; total supply, 21,000,000 (26,000,000) tons; home usage, 17,900,000 (20,400,000) tons; exports, 3,700,000 (4,400,000) tons; stock reduction 600,000 (stock increase, 1,200,000) tons; total demand, 21,000,000 (26,000,000) tons.

Scotland has shown the biggest percentage increase (35.2) in the weekly average rate of output of steel ingots and castings for June, compared with June, 1959. Staffordshire, Shropshire, Worcestershire, and Warwickshire (27.6) and the North-east coast (24.7) have also made considerable increases. The North-west coast has increased output by 13.8 per cent., Derby, Leicestershire, Nottinghamshire, Northamptonshire, and Essex by 12.8 per cent., Lancashire (other than the North-west coast), Denbighshire, Flintshire, Cheshire, and Yorkshire (other than the North-east coast and Sheffield) by 12.3 per cent., South Wales and Monmouthshire and Sheffield, both by 9.1 per cent., and Lincolnshire by 6.9 per cent.

Consett Iron Working to Capacity

SINCE the beginning of April orders for all the products of the Consett Iron Company, Limited, have continued at a high level, states Lord Ridley, the chairman. Output for the first half of the year was at a slightly higher level than for the previous six months. After the holidays last year No. 3 blast furnace was blown in following relining and there was a short period of adjusting the plant to a higher level of performance. Since that time all departments have been working to capacity.

Lord Ridley says that before the company ordered the new steelmaking plant a technical investigation into the various new processes for oxygen steelmaking was carried out. As a result, it had been decided to use the LD process for making the normal range of steels and the Kaldo process for the variety of special steels which the company produces. The construction of the new plate mill is proceeding satisfactorily and it is expected to be in operation by the scheduled date.

The new foundry came into operation in June, 1959, and nearly all of its output is used in the melting shop. The last of the three blast furnaces was converted for operation at top pressure during the year and the increased output target was achieved. The re-equipment of the works with diesel locomotives instead of steam was also completed with, states the chairman, a noticeable saving in operating cost.

The year's trading surplus of £4,040,000 was at a rate which was a great improvement on that for the previous six months and also better than the previous full year, he announces. During the year £7,500,000 was spent on the new plant—£6,000,000 being borrowed from the Finance Corporation for Industry—and in view of the large capital expenditure programme, Lord Ridley stresses the need to conserve the financial resources. For that reason the dividend is maintained at 8¼ per cent.

ITALIAN STEEL PRODUCTION in the first half of 1960 reached 4,120,000 metric tons—30.3 per cent. more than in the corresponding period of 1959.

Appointments

General Managers for Head Wrightson Group

NEW general manager of the Head, Wrightson & Company, Limited, subsidiary, Head Wrightson Steel Foundries, Limited, is Mr. J. D. ECCLES. Mr. Eccles, who joined the company in September, 1954, is a son of Sir David Eccles, Minister of Education.

Mr. W. H. ADAMS, who has been appointed general manager of Head Wrightson Iron & Steel Engineering, Limited, joined the Head Wrightson group in June, 1952, on the administrative side. He has recently returned from India where he had been projects manager at Durgapur since April, 1956.

MR. J. D. ECCLES

A third appointment announced is that of Mr. G. W. WILSON, as general manager of the Cupola Mining & Milling Company, Limited, another Head, Wrightson subsidiary. Mr. Wilson has been with the group since March, 1957.

Mr. B. A. GOMM has been appointed manager of F. Perkins (Australia), Limited, a subsidiary of the F. Perkins, Limited, group.

Formerly sales engineer for the Cummins Engine Company, Limited, Shotts (Lanarkshire), Mr. JOHN C. SKARRATT has been appointed manager of the London office.

Mr. ROBERT BRADLEY has joined Stanley Works (Great Britain), Limited, joiners' tools manufacturers, of Stanmore (Middx), as chief planning engineer. He has previously been with Duncan & Elliott, Limited, and the Plessey Company, Limited.

Mr. J. A. BROOKS has been appointed divisional assistant manufacturing manager of the motor and control gear division of Associated Electrical Industries, Limited. For the time being he will continue as superintendent of the large industrial machines department at the Manchester works, but will eventually transfer to Rugby.

Mr. R. R. G. P. JACKSON, divisional mechanization engineer of the Northern (N&C) Divisional Coal Board since 1950, is to join Gullick, Limited, Wigan, as senior mining engineer. He was chief surveyor and later manager of a group of four collieries of the Bengal Coal Company, Limited, and he joined the NCB in 1948 on his return from India.

Mr. C. W. TAYLOR, who has joined the headquarters staff of Firth Cleveland, Limited, as assistant to Mr. G. Harries, the company's secretary and group chief accountant, was previously secretary of Richard Hill, Limited, and Richard Hill Rolling Mills, Limited, Middlesbrough, both members of the Firth Cleveland group. He has been succeeded at Middlesbrough by Mr. ELSDON HAILS.

Mr. W. U. CHAPMAN, manager of the industrial products department of the Goodyear Tyre & Rubber Company, Limited, for the past 16 years, has been transferred to the export sales division of the company. He is succeeded by Mr. J. T. Pearson, who joined the company in 1953 and has been responsible, as sales engineer, for the industrial brake programme and for special technical assignments within the manufacturers' sales division.

Mr. R. J. HASBURY, manager of Highley Colliery, Alveley (Salop), has been appointed manager of No. 1 Group, South Staffordshire and Shropshire Area, West Midlands Divisional Coal Board, with effect from a date to be determined. Mr. Hasbury, who entered the industry as a mining student in 1939, was for three years colliery surveyor at Madeley Wood Colliery before being appointed manager at Highley in 1948. He is secretary of the South Staffs branch of the National Association of Colliery Managers.

Mr. G. THICKETT, who has been combining his duties as works manager (heavy departments) with those of billet mill manager for Samuel Fox & Company, Limited, a branch of the United Steel Companies, Limited, is to relinquish the latter appointment. Mr. E. HAMPSHIRE at present production controller, becomes billet mill manager, and he is succeeded by Mr. N. P. BROMILEY. Mr. C. GRAY, assistant to the bar and rod mill manager has been appointed assistant manager, bar and rod mill. The changes take place on August 1.

Mr. L. Smith for North-Eastern Division Appointment

MR. LESLIE SMITH has been appointed deputy Area production manager (planning) of the No. 8 (Castleford) Area of the North-Eastern Divisional Coal Board, where he has been planning engineer since 1947. He began his career as an assistant manager at Manton Colliery in 1922. A year later he became undermanager at Rotherham Main Colliery and in the following year was appointed assistant manager at Silverwood Colliery. He was appointed manager of Roundwood Colliery four years later and in 1931 returned to Silverwood as mechanization officer. In 1934 Mr. Smith became manager of Rotherham Main, and manager of St. John's Colliery in 1935.

In 1941 he went to the Ministry of Labour and National Service as a mining engineer on special duties. From 1942-46 he served in the Ministry of Fuel and Power, first as assistant director of production and mechanization officer, then as group production director and finally as joint regional director of production for West Yorkshire.

Scottish Trade Mission's Successful Russian Tour

SCOTTISH trade mission led by Lord Clydesmuir, which returned from Moscow at the weekend, has one firm order and hopes of many more. The mission was organized by the Scottish Council (Development and Industry) and consisted of 11 Scottish businessmen. They had a week's discussions with Soviet foreign trade corporations and "all of us were pleased with the general progress made," said Lord Clydesmuir on Monday.

The group had two objectives. One was to gain individual orders and make business contacts. The other was to collect information for the Scottish Council about methods of exploiting the Russian market.

LEA HALL COLLIERY

West Midlands' First Wholly New NCB Pit

ALTHOUGH his remarks were tempered with a counsel of caution, Mr. E. H. Browne, chairman of the West Midlands Divisional Coal Board, found much in the coal-mining industry to afford confidence and optimism for the future. Mr. Browne, whose appointment as a deputy chairman of the National Coal Board was announced recently, was speaking at the official opening on Tuesday of the new Lea Hall Colliery, Rugeley (Staffs), by his wife.

Mr. Browne believed the new colliery to be a pledge for the future of coal mining. The industry was dependent upon capital development to make it and keep it modern: it was dependent on modern pits like Lea Hall. But, equally, it would depend upon the people who worked in it. Misconceptions had led to losses of men and he felt it of importance to restore confidence.

MR. E. H. BROWNE

Lea Hall was the West Midlands Division's first wholly new NCB colliery ready to produce coal. There were other schemes in the division as large, but this was a completely new pit, the reserves having been proved and the whole project conceived and carried out since vesting date.

Burdens on the NCB

Referring to the wide misconception about the industry, Mr. Browne recalled that the Coal Board had wrestled for 10 years to increase annual output by over 30,000,000 tons, the need for which had vanished almost overnight. It was true also that the board had not been free to act altogether commercially and, as a result, the financial position of the industry was not all that could be desired. Profits of £300,000,000 would have been sufficient to meet in full interest and taxation charges had it not been for the loss incurred through the board's obligation to import American coal at a cost of about £74,000,000.

It was also true that productivity in the industry was the highest and costs were the lowest in Europe and that 195,000,000 tons of coal would be sold this year.

He was not concerned with political issues, he said, but he thought that if policies had to be carried out in the public interest, this factor should be recognized when the board was assessed in terms of a commercial concern. It was a relevant factor, too, in relation to competition with oil. For certain processes oil possessed real advantages but he felt that many conversions had followed fashion rather than economics. For the great bulk of fuel needs—heating and steam raising—the advantage in cost was strongly in favour of solid fuel, but oil did not have the special burdens imposed on the coal industry in the national interest. Competition, therefore, should be on an equal footing.

The demand for coal for power stations was expected to rise to over 80,000,000 tons within 10 years; steel would continue to make huge demands, and solid fuel would take the base heating load for the country. Informed opinion was, therefore, able to foresee the future demand for coal remaining at a high level, but it was imperative that a clear-sighted view should be taken and political distortions done away with.

Lea Hall, which has cost £14,000,000, is expected to make available 148,000,000 tons of coal reserves. Production should reach a peak of 6,250 tons a day between 1964 and 1965 and the present manpower of 750 should have risen to 3,000. Coal from Lea Hall will replace tonnage lost by the exhaustion of collieries in the older part of the Cannock coalfield and just over half the output is earmarked for the adjoining new power station which is being linked to the colliery by conveyor belt.

"Recruits Need not Fear for Future of Coal"

DISCUSSIONS on the need to recruit more men and boys into the Lancashire pits have been held by the North Western Divisional Coal Board and the Lancashire Area of the National Union of Mineworkers. A joint statement issued by the board and the NUM says: "All who come into the industry need have no fears for their future. Coal will continue to be produced in vast quantities for many years to come, and there will be secure jobs for those who work in the industry."

The statement says that the aim of the Coal Board and of the NUM is to ensure this security, so that every man will continue to work until his retirement, when he will draw his mineworker's pension. It goes on: "The men most needed now are those trained men who left the pits in recent years in the mistaken belief that coal did not offer security. Next in priority are the youths, who are needed to train as the craftsmen and mineworkers of the future. There will also be openings for young fit men who have never previously worked in the pits."

Recruitment has been at a standstill for some time in Lancashire, but it is hoped to recruit about 1,500 men during the remainder of this year. Between 5,000 and 6,000 more men may be needed next year.

Personal

Accles & Pollock Honours Former Chairman

ON retiring from the chairmanship of Accles & Pollock, Limited, makers of seamless steel tubes, of Oldbury, Mr. W. W. HACKETT has accepted an invitation to become the company's first president. Mr. Hackett's retirement marks 61 years' service with Accles & Pollock, which he helped to found. He was also a founder member of the parent company, Tube Investments, Limited, and served on its board for many years.

Last December Mr. Hackett had the unusual distinction of being presented with a silver watch by the chairman and directors of TI to mark 25 years' active service for the company. The quarter century was achieved by Mr. Hackett at the age of 85, 25 years after had "officially" retired!

Presentation was made last Friday to Mr. ALFRED GOODISON, paring shop chargehand of George Clark (Sheffield), Limited, to mark his completion of 50 years with the firm.

Members of the Yorkshire Area of the National Association of Colliery Overmen, Deputies and Shotfirers made a presentation recently to Mr. STANLEY SHEARD, on his retirement from the executive committee. Mr. Sheard has worked at Ackton Hall Colliery (Yorks) for 51 years.

Mr. HERBERT H. BURTON, agent and manager of Group "A" collieries (Sharlston and Wakefield) of the Wakefield Area of the North-Eastern Divisional Coal Board, retired on Saturday after 40 years in the mining industry. Mr. Burton has been a member of the National Association of Colliery Managers for much of that period.

After nearly 51 years in the mining industry, Mr. JOHN DRYBURGH has retired. For the past 34 years he has been cashier at Lindsay Colliery (Fife) and he has never lost a day's work through illness. He started work as an apprentice clerk at Aitken Colliery in 1909 and worked at Dalbeath and Hill of Beath collieries before transferring to Lindsay in 1926.

To celebrate his 70th birthday Mr. HARRY BOTTOM, chairman and managing director of the Sheffield companies of Roper & Wreaks, Limited, general and precision engineers, Stainless Plating, Limited, and William Bowker & Sons, Limited, silver platers, and of Trier Bros., Limited, manufacturers of lubricating equipment, of London, S.E.5, has donated £10,000 to start a pension scheme. Employees from all four companies will benefit from the scheme which is to be controlled by Mr. Bottom.

Scottish Colliery Thinks Tribunal Award "Niggardly"

NUM members at Michael Colliery, East Wemyss (Fife), agreed to send a resolution to the union's Scottish and national executives and to the Prime Minister protesting against the "niggardly" decision of the National Reference Tribunal to cut the working week by one hour.

Mr. James Miller, chairman of the colliery branch of the NUM, said: "The reduction amounts to 12 minutes a day. If you break your bootlace or are a bit slow putting on your jacket you will have lost it."

Mr. Robens "Not Afraid of Change"

"I AM not going to the National Coal Board to direct the industry's funeral rites," Mr. Alfred Robens, Labour MP for Blyth and chairman-designate of the NCB, reiterated at a Parliamentary Press Gallery lunch at the House of Commons on Wednesday. Britain's basic industry was going to be a key industry for this country, so far as it lay within his power, he said.

Saying that he was not afraid of change, Mr. Robens went on: "I am sorry that leaders of the miners' union have made up their minds about things so quickly, so much in advance, from information which they may think is perfectly good, but which I can tell them is perfectly bad." When people talked glibly about decentralization, he sometimes wondered whether they knew what they were talking about. He had always been a great believer in decentralization of authority from the centre to the periphery.

"There are some vistas of this vast industry where you need to have some decentralized control. It is all a matter of degree," Mr. Robens declared.

To those who tried to alarm the mineworkers about a return to pre-war days, he replied: "Surely no one would believe I would take the chairmanship of the Coal Board and return the industry to pre-war days. It is too fantastic to believe that, unless I have been bought for £10,000 a year. But my price is very much higher than that."

Mr. Robens spoke of his wish to stop people "passing the buck." "I do not intend to have my desk littered with papers for my decision. If people cannot make decisions lower down themselves, then they are the wrong people. We must get people in who can. They are entitled to make two wrong decisions, but not three," he declared. He believed that if people were given authority and were paid well for exercising it, they would take good care that their decisions were right decisions. "I am prepared to take the risk of having decisions lower down," he said.

Until February 1, when he took over from Sir James Bowman, he did not propose to do any work for his salary. "I propose to find out the way the people are running this industry at the centre and in the divisions, and to make assessment of abilities and everything else," Mr. Robens said.

Minister of Power's Visit to NCB Engineering Centre

"THE future of mechanization is immensely important because of the necessity for the coal industry to become more efficient, and the development of suitable production processes by means of machinery is essential," said Mr. Richard Wood, Minister of Power, during a visit to the National Coal Board's Engineering Establishment at Bretby (Derbyshire) last Friday.

Mr. Wood said the prospects for coal were first class, but its future did depend on a continued increase in productivity and efficiency, which was the basis of the work being carried out at the establishment.

The Minister was accompanied on the tour by Mr. H. E. Collins, NCB member of production, Mr. B. L. Metcalfe, NCB director of engineering, and Mr. E. J. Moss, acting director of the Central Engineering Establishment.

NUT-BOLT PACT VALID

Price Fixing Agreement Upheld in Court Judgment

PRICE-FIXING scheme in the agreement between members of the Black Bolt and Nut Association was not contrary to the public interest, the Restrictive Practices Court has decided, but the quantity discount allowed under the agreement was against the public interest. Mr. Justice Diplock, in his judgment, states: "Whatever theoretical objections there might be to the way in which the prices are fixed, they are reasonable in that they give no more than a reasonable return on capital employed and on turnover. Further, the industry is now a highly efficient one, which has maintained a high and uniform standard of product of the highest quality."

Mr. Justice Diplock said that the 44 members of the association produced about 90 per cent. of the total supply of black bolts and nuts, carriage bolts and nuts, and railway fastenings. The larger manufacturers produced the standard sizes, of which there were over 3,000 different varieties, and the smaller manufacturers the more specialized sizes.

The bulk of the demand for black bolts was for use in industry as components of some larger construction or finished product. The cost of black bolts formed a trivial proportion of the cost of the finished product.

Graduated Discounts

The price-list on which the association operated was based on an average of the costings in 1953 of the 11 larger manufacturers, of 100 different products, but the actual price of a particular item in the price-list did not bear any definable relationship to the average cost of making it. The price in the price-list applied to the normal ordering quantity; for other orders there was a graduated tariff of discounts decreasing until the quantity ordered was so small that there was a plussage of 5 per cent. on the basic price.

There were three special discounts: the large order discount, the inter-trading discount, and the quantity discount for prescribed quantities of products ordered over a year from members of the association. This special quantity discount was a sop to the large buyers and was of advantage only to them. Since they comprised only one third of the trade, it could not be justified as a benefit to the public, nor could the special procedure adopted for sales to government departments.

When an inquiry was received from a government department, the member was required to notify the secretary of the association the price which he intended to quote. The lowest price as reported by the member was then circularized to all members interested in quoting and became the minimum price. No serious attempt was made to justify this procedure, which was of no benefit to the public.

Most of the black bolts were sold to the stockholders (the wholesalers in the industry) and to industrial users. The advantage of the uniform price was that neither the stockholders nor the industrial consumers had "to go shopping." At present they knew the price they could quote and must pay, from whatever manufacturer they bought. The only matter for negotiation in ordering goods was the date of delivery. If the prices for the individual items of the many hundreds of sizes and shapes which they had to stock or purchase varied from manufacturer to manufacturer, they would be compelled to make many more inquiries before giving an order and there would be a substantial increase in administrative costs.

Under the rules of the association, Mr. Justice Diplock went on, there was no express manner by which prices were fixed, and the matter was left to the discretion of the central council subject to the approval of a majority of the members in general meeting. If the effect of a declaration that the price restrictions were in the public interest gave *carte blanche* to the association to fix its prices at whatever level it liked, this would be a detriment outweighing the benefit derived from the avoidance of "shopping." But that would not be the effect of such a declaration.

The court in giving its decision was entitled to look at the way prices had been fixed in the past and to the probabilities of how they would be fixed in future. In this case, the association had honestly and conscientiously tried to change its fixed prices in accord with changes in costs allowing for more than a reasonable margin of profit.

The view of the court being that there were no detriments to outweigh the benefit of a uniform reasonable price, the association had proved that its scheme was not unreasonable.

Steel Research Men Must Keep Close Watch on China

IN order to keep a close watch on the developments in Communist China's rapidly growing steel industry, research workers at Sheffield steelmaking firms are to begin studying Chinese in the autumn. The scheme has been introduced at the suggestion of Mr. Robert Sewell, information officer at the Sheffield headquarters of the United Steel Companies, Limited.

Insisting that there was a lot of valuable information to be had if only British technologists understood Chinese, Mr. Sewell said that in 10 years Communist China could become one of the UK's most serious competitors in steel.

He understood that the Chinese now had automatic blast furnaces bigger and better than any in the United States and some of the Chinese open-hearth steel furnaces could process 600 tons at a time, whereas the UK's biggest took around 450 tons.

Northern NCB Training Head Retires

HEAD of industrial training branch, Northern (N&C) Divisional Coal Board, Mr. George Wightman, retires at the end of July after a lifetime in colliery management, training, and education. He began his career with the Dalmellington Coal & Iron Company, Limited (Ayrshire), and later served as overman, undermanager, and manager at collieries in Scotland, the North, and the Midlands.

From 1942 to 1947 he was an assistant director of the Northern Region of the Ministry of Fuel and Power, a position he held until vesting day, when he was made training and education officer for the old Northern Division of the National Coal Board. In 1950 he was appointed to the same position in the newly-formed Northern (N&C) Division. Mr. Wightman was also for 27 years a lecturer at evening classes in mining engineering at technichal colleges. He is succeeded by Mr. D. Sutherland, No. 2 (Mid-Northumberland) Area training officer.

Mr. Patrick Carr, head of manpower branch, industrial relations department, Northern (N&C) Division since 1959, also retires at the end of July, after 52 years in coal mining. He started work at the Percy Pit, Lemington-on-Tyne, and began his trade union career at 17 as putters' representative at the Caroline Pit, Denton Burn. He was a member of the Durham Mining Federation Board, and served on the Northumberland Miners' Executive and Joint Conciliation Committee.

In 1942 he was appointed assistant labour director of the Northern Region of the Ministry of Fuel and Power; and became (at vesting) labour officer for the South Northumberland Area of the Northern Divisional Coal Board, a position he held until the formation of the Northern (N&C) Division and his appointment as divisional conciliation officer. Mr. Carr is succeeded by Mr. W. Kennedy, secretary, industrial relations department, Northern (N&C) Division.

Awards to Miners After Fire Incident in Colliery

PROMPT action by five men during an emergency at Thornley Colliery (Co. Durham) was recognized by a presentation on Tuesday, when each received a meritorious service certificate from Mr. L. C. Timms, No. 3 Area General Manager, on behalf of the Durham Divisional Coal Board, and a gold watch from Mr. R. Kellett, Shotton and District Mines Inspector, on behalf of Thornley Colliery Federation Board.

The men were Mr. James O'Connor and Mr. Laurence Crangle, both coal-cutter operators, Mr. Dennis Elliott, shotfirer, Mr. Robert G. White, overman, and Mr. Ralph Woodward, Jnr., acting deputy. The incident occurred last month in the County Busty Seam of the colliery. Mr. Elliott had fired several shots and saw a sheet of flame. He switched off the electric current and ran to tell Mr. White and Mr. Woodward. The three men returned to the coal face and, finding no gas, used fire extinguishers and then sprayed the place with a water hose from a cutting machine. Meanwhile, Mr. White and the two other men cited had gone to warn workmen in the vicinity.

This particular award was introduced by Durham Divisional Board nearly two years ago to mark praiseworthy acts by employees.

Miners' Leader Attacks "Policy of Defeatism"

IF the Government proposed regionalization of the coal industry, it should say so openly and not resort to non-Parliamentary methods to get round the provisions of the Nationalization Act, said Mr. Sam Watson, general secretary of the Durham Area of the National Union of Mineworkers, in a message to the Durham Miners' Gala held last Saturday.

The industry, he said, could not be efficiently run on such a basis of regionalization. "Our trade in coal is interlocked district by district; the price structure is nationally controlled. In these and other matters we are members of one family, not orphans left to the whim and fancy of economic interplay. It is our fervent hope that no such policy is contemplated, for it is a policy of defeatism and political prejudice, and not of hope and progress for a great industry."

Mr. Watson maintained that there should be some rethinking at Government level if the industry was to find its rightful place in the nation's fuel economy. It was against the national interest to treat coal, gas, electricity and atomic energy as separate entities. They were all essential to each other, and the sooner someone at top level with vision and courage understood the great potential of Britain's energy industries and married them in a national scheme the better.

The need, said Mr. Watson, was for greater co-ordination and co-operation within the separate industries. The union would be failing both in its duty to its members and its obligations to the country if it did not resist a policy which set district against district, coalfield against coalfield, and pit against pit. "This policy failed utterly between the years 1918 and 1939 and brought the industry nothing but economic bondage, unemployment, and bitter labour relations," he said.

"The nation's greatest asset is her plentiful supply of energy. Our greatest challenge is to harness it to modern industrial technique on a national basis and not link it to the parish pump. It is the lack of such a national fuel policy which has kept Britain below the industrial growth of other countries for the last decade."

Mr. Hugh Gaitskell, Labour party leader, addressed the miners, and among the guests was Mr. John Hay Whitney, the United States Ambassador.

PRICES OF RAW MATERIALS STABLE IN JUNE

INDEX of wholesale prices for basic materials and fuels used in manufacturing industry is given provisionally by the Board of Trade as 102.5 (1954 = 100) for June—the same as in May. The index has now been steady since March. There have been a number of price changes for constituents of the index, however, including declines in the prices of lead, zinc, and rubber.

The rising trend in prices of materials used in the mechanical engineering industries persisted in June. There was also a slight rise in June in the index of prices of all manufactured goods which, on the same 1954 basis, rose to 112.9 from 112.8.

CONSTRUCTION is to begin next year of a steelworks at Skoplje, in the Yugoslav republic of Macedonia. The plant will produce about 1,000,000 tons a year, roughly a third of the country's total output.

European Coal Forecast

RISE IN DEMAND IN THIRD QUARTER, 1960

DEMAND for coal in Europe is expected to increase by 5 per cent. during the third quarter of 1960 compared with the same period last year, it was reported by the coal trade sub-committee of the United Nations Economic Commission for Europe at its recent quarterly meeting in Geneva. The increase is expected to take place mainly in coke-ovens and in the thermal power stations. The steel industry's coke requirements are expected to be 11 per cent. above the corresponding period of last year.

Statements by representatives of the West European producing countries showed that on the whole the situation of their coal industries is expected to show an improvement as a result of the increases in demand and of measures being taken to reduce marginal capacity. The level of pithead stocks in Europe is unlikely to increase any further during the third quarter, but some part-time unemployment is expected to continue in mines in some countries.

In Belgium, part-time unemployment is expected to take place at a lower rate than in previous quarters, while in France part-time unemployment is likely to continue. In west Germany, apart from a limited amount in the Saar, no part-time unemployment is anticipated and pithead stocks are expected to be reduced. In the UK, pithead stocks are likely to be 2,000,000 to 3,000,000 tons lower by the end of the year than at the end of 1959.

ECSC Warning to Belgium

The High Authority of the European Coal and Steel Community has warned Belgium it will have to "reckon with the consequences" if the promised second coal reorganization plan containing the names of Belgian pits to be closed is not laid before the executive in the near future. The Authority has given a strong indication of its determination to carry through a reduction of Belgian coal output during the current year. At present, production rates are not, as planned, on the decrease, while the Belgian Government has several times postponed the laying before ECSC of the second stage of its coal programme.

This week the Authority received a delegation of Belgian coal consumers, who have complained that they are at present unable to buy coal from areas where prices are lower than in Belgium. The meeting was followed by talks between the executive and delegations from Belgian coal producers and from the country's mineworkers' union.

The Belgian Government has promised the Authority that it will lay a Parliamentary Bill for the formation of a fund from a tax of 60 Belgian francs (about 8s. 6d.) per metric ton of fuel oil before the Authority as soon as the Bill has passed through initial Parliamentary procedure. The Government states that no decision has yet been made as to the purpose to which the fund will be put, but it is likely that it will be set against Authority subsidies or else be put to uses for which the direct permission of the Authority is not needed. The fund will not, the Government stresses, be used to compensate for losses through alterations in the volume of imports from other ECSC countries or from non-ECSC sources.

The Ruhr coalmining towns of Bottrop, Castrop-Rauxel, Gladbeck, Herne, Recklinghausen, Wanne-Eickel, and Wattenscheid have appealed to the German Federal Government and the State Government of North Rhine-Westphalia for help in the introduction of new industries. The towns, almost completely dependent on coalmining, say they cannot undertake such reorganization on their own.

The Council of Association between the United Kingdom and the High Authority of ECSC met in Luxembourg on Tuesday to receive reports from its, steel and trade relations committees.

The UK was represented by Mr. Richard Wood, Minister of Power; Mr. Frederick Erroll, Minister of State, Board of Trade; Sir James Bowman, chairman of the National Coal Board, and Sir Cyril Musgrave, chairman of the Iron and Steel Board. The ECSC Authority was represented by its vice-president, Mijnheer Dirk Spierenburg, and members M. Albert Wehrer, M. Pierre Olivier Lapie, and Herr Fritz Hellwig.

UK Coal Exports to Belgium to Go Up 20 Per Cent.

INCREASE of 20 per cent. in British coal exports to Belgium was agreed in the Council of Association between the UK and the European Coal and Steel Community which met in Luxembourg on Tuesday. The effect is to raise this year's supply of British coal to the Belgian market from 110,000 to 132,000 tons. UK representatives in the Council were not satisfied with this quota, which is part of the 600,000-ton limit of Belgium's quota from outside the ECSC.

According to the High Authority, the quota of 400,000 tons already allocated to the US could not be reviewed. In addition to this regular quota the US has a special quota of 500,000 tons of coking coal which Belgium may import for re-export as coke. This is being used to build up the Belgian processing trade, notably for sale in the Luxembourg market, which is mainly supplied from Germany.

The Belgians have refused to grant Britain a similar quota for anthracite. The argument—which has the Authority's support—is that the anthracite, unlike US coking coal, would not be re-exported. The traditional trade from Britain into Belgium, which amounted to 500,000 tons annually in 1954-57, was chiefly in anthracite and Durham steam coal. In present Belgian conditions there is no sale for the latter, and the current trade is almost wholly in anthracite.

Orders Placed

Electrical Power Link With France

CONTRACT for cross-Channel power cables valued at £610,000 has been placed by the Central Electricity Generating Board with Associated Electrical Industries, Limited, and British Insulated Callender's Cables, Limited. The two firms will lay half of the submarine power cable link which will connect the national electricity systems of Britain and France. Differences in demand upon the British and French networks result in the availability of some hundreds of megawatts at peak winter loads and, as planned, the connection will transfer 160 megawatts of power from one system to the other at peak periods.

The contract calls for the manufacture and laying of two similar 15-mile lengths of single-core submarine cable and two related land cables, the work being divided equally between the two companies. The cross-Channel interconnection is expected to result in a net annual saving to this country of £250,000.

A CONTRACT to build a sulfuric acid and single superphosphate plant for Adarsh Chemicals & Fertilizers, Limited, at Bombay, India, has been awarded to Chemical Construction (G.B.), Limited.

DANISH COMPAY, Droningborg Maskinfabrik A/S, has ordered 400 Four 99 diesel engines from Perkins Engines, Limited, Peterborough. They are to be used in the Danish company's self-propelled combine harvester.

COAL DREDGER worth £A891,000 has been ordered by the Victoria State Electricity Commission from Orenstein-Koppel, of Germany. More than half of the 1,400-ton machine will be made in Australia under subcontract.

FURTHER ORDER from Russia for 1,500 metric tons of seamless steel tubes worth £135,000 has been gained by Stewarts and Lloyds, Limited. Recently the company completed an order for Russia for 8,000 tons of this type of tube.

CONTRACT for the new multi-storey building of the National Bank of Kuwait, to be built in Kuwait, has been secured by James Austin & Sons (Dewsbury), Limited. The contract is worth £95,000 and is the largest export order placed with the company.

THROUGH the material handling division of John Blackwood Hodge & Company, Limited, London, W.1, Euclid motor scrapers have been ordered by the Central Electricity Generating Board for coal and dust handling at High Marnham and Padiham "B" generating stations.

BASE EXCHANGE PLANT and deaerator for a set of new boilers has been ordered from William Boby & Company, Limited, water treatment engineers, of Rickmansworth (Herts) by Hickson & Welch, Limited, chemical and wood preservative manufacturers, of Castleford (Yorks).

CONTRACT valued at approximately £300,000 has been placed with Powell Duffryn Engineering Company, Limited, by Richard Thomas & Baldwins, Limited. It is for the provision of a site workshop and general miscellaneous engineering services at the new Spencer Steelworks at Llanwern (Mon).

ORDER TO SHIP £75,000 worth of vertical hollow shaft and drip-proof electric motors to the Batala Engineering Company (Pakistan), Limited, has been received by Newman Industries, Limited, electrical and mechanical engineers of Bristol. It is estimated that the Pakistan company will require an additional £250,000 worth of motors over the next two years.

AUTOMATIC AND MANUAL VALVING for a rubber tyre plant to be built in Rumania is to be supplied by Hunt & Mitton, Limited, Birmingham, to Francis Shaw & Company, Limited, Manchester. The order is worth over £55,000. The valves will control steam, high pressure hot water, air, vacuum and cold water services to the Shaw McNeil Bag-o-matic tyre vulcanizing presses.

GAS CLEANING PLANT for a Babcock & Wilcox single furnace boiler, which is to be installed at Thorpe Marsh power station, is to be supplied by Sturtevant Engineering Company, Limited, London, E.C.4. The company has also received an order for gas cleaning plant for two boilers to be installed by John Thompson Water Tube Boilers, Limited, at the Central Electricity Generating Board's Drakelow "C" power station.

FOR THE FIST TIME in the history of the South African mining industry, shaft sinking has been undertaken by an outside contractor. The Cementation Company (Africa) (Pty), Limited, has already completed a 17 ft. diameter ventilation shaft to a depth of 1,987 ft. at the mine in Namaqualand, Cape Province, of the O'Okiep Copper Company, Limited, and is to begin on the main shaft next month. This will be 20 ft. finished diameter and fully lined in concrete for its 3,000-ft. length.

WHAT IS CLAIMED to be one of the largest pressure vessels in the world has been built by Cochran & Company, Annan, Limited, boilermakers and engineers, of Annan (Dumfriesshire), for Petroleos Mexicanos. It was constructed in three sections, is 215 ft. long, 12 ft. in diameter, and weighs over 134 tons. The order was placed in connection with an engineering contract of Fluor Engineering & Construction, Limited, London, for extensions to the Minatitlan Refinery, Mexico.

DISMANTLING AND DISPOSAL of the plant and buildings of the former Normanby Ironworks, Limited, Middlesbrough, is to be carried out by George Cohen, Sons, & Company, Limited, a member of the George Cohen 600 Group, Limited. Almost 9,000 tons of plant is involved in the operation and much of the ancillary plant, including conveyors, machine tools, generating equipment, etc., is in good condition and will be available for sale through the group's machinery division.

CONTRACT for the supply of prestressed concrete pressure pipes and spun iron pipes worth approximately £400,000 has been placed with the Stanton Ironworks Company, Limited, near Nottingham, by the Cardiff Corporation Waterworks. Three miles of 60-in. and 42-in. diameter prestressed concrete pressure pipes will carry the raw water to the Llandegfedd reservoir and a further 7½ miles of 30-in. prestressed concrete pressure pipes will be used in the pure water main. The gravity main to Cardiff will comprise five miles of 24-in. spun iron pipes with Tyton joints.

PIPE PLANT FOR AUSTRALIA

COMPANY is being formed by Australian and American interests to make cast-iron high-pressure pipe at a new factory at Broadmeadows, Victoria, Australia. The companies combining are James B. Clow & Sons, of the US, and General Industries, Limited, of Sydney. The new plant, which will cost £A1,250,000, will begin operations early in 1961 on a 39-acre site adjoining the new Ford motor plant.

It is expected that the new plant will make Australia independent of overseas supplies of these types of pipe, imported mostly from Britain and France.

Law Cases

MOISTURE IN "COALITE"

County Council Loses Case Against Merchants

LEAMINGTON magistrates have dismissed two charges alleging that Thomas Horswill & Son, Limited, fuel merchants, of Leamington, had applied a false trade description to deliveries of a patent household fuel, "Coalite." Costs of £100 were awarded against Warwickshire County Council who had alleged that the deliveries had contained excessive moisture. At an earlier hearing the county council had alleged that one of the loads contained 31 per cent. of moisture and the other 19 per cent.

For the company, Mr. L. G. Scarman, QC, said that although there was a British Standards specification for coke there was none for "Coalite" which was made by a different process and was highly combustible. "In the manufacturer's view, odd as it may seem, moisture is an essential constituent of this fuel," he said. "It is both a safety and a modifying factor. There is no shred of dishonest trading in this matter."

The load, samples from which contained 31 per cent. moisture, was taken straight from the railway truck and delivered the same day. An even percentage of water could not be ensured in the manufacturing process. The average was 15 to 17 per cent. but there were bound to be small patches with very much more than the overall content.

"This would be serious if it made it an unacceptable fuel," Mr. Scarman said. "Fortunately, it does not. This 31 per cent. sample was not the result of advantageous dousing by rain or dishonest traders, but something which could not be avoided in the manufacturing process."

Head of the carbonization and fuel research department of Coalite & Chemical Products, Limited, Mr. C. E. Needham, also gave evidence.

Amendment Plea Lost in Miners' Action

LAST-minute amendment to an action brought by a West Lothian miner in Edinburgh Sheriff Court arising from an accident in 1949 was refused by the First Division of the Court of Session. The action is by John Kerr (39), who claims £5,000 damages from the National Coal Board for head injuries sustained in an accident in Polkemmet Colliery, Whitburn.

Lord Clyde, the Lord President, said the amendment involved deletion of all the grounds of fault upon which the action had previously proceeded. It introduced a totally different account of what the accident had been, different grounds of fault on the part of the defenders, and alleged negligence against one and possibly two employees of the defenders who had not previously been blamed at all. This was fair neither to the other party to the case, to those summoned to be balloted for the jury, nor to the witnesses.

The claim was first raised in August, 1958, and in January, 1959, the record was amended by the pursuer and the defenders. Trial was fixed for May 6, 1959. The day before the trial was due to take place the pursuer asked leave to make further amendment of his pleadings. This was refused, but leave to appeal was granted.

CIGARETTES DOWN PIT

TWO men were each fined £20 at Rugby Magistrates' Court on summonses relating to smoking and taking cigarettes underground at Binley Colliery (Staffs). Cyril Allen was summoned for taking two cigarettes and two matches below ground and for handing a cigarette to be smoked underground to Henry Kallas. Kallas was summoned for having a cigarette and match in his possession and for smoking underground.

Mr. E. M. Scott-Barratt, for the Coal Board, said that Mr. J. H. Linton, a colliery deputy, carrying out an inspection at the coal face, saw Allen take a piece of paper with something wrapped in it out of his pocket and hand it to Kallas, who crawled a little farther up the face near the conveyor and lit a cigarette with a match. Mr. Linton went to Allen and took from his trouser pocket a cigarette and match. Kallas was still smoking, and when the deputy put out his hand to take the cigarette Kallas pushed it into the coal dust. Both men were ordered to leave the pit. The next day three sandbags of coal dust taken from the spot contained parts of a cigarette.

Allen denied having a cigarette and match in his possession, and Kallas said he had not been smoking.

STEEL COMPANY FINED

AT Hamilton Sheriff Court, the Lanarkshire Steel Company, Limited, Motherwell, pleaded guilty to failing to keep in position the fencing on a plate shearing machine and was fined £10.

A factory inspector said it was essential that the blades of the shearing machine were properly fenced while the machine was in motion. On April 7 two men were operating the machine while the guard was not in proper position. Though no one was injured, it would have been possible for a worker to put his hand close to the guillotine blade.

MINE WAGES THIEF JAILED

MAN who in 18 months systematically raided workers' lockers at more than 80 collieries in six counties, stealing over £1,000 in miners' wages, was sent to prison for three years at Nottinghamshire

Quarter Sessions Appeals Committee. He was Roy Clayton (23), who admitted seven locker theft offences and asked for 131 more to be considered. Clayton was said to have travelled hundreds of miles by car almost every Friday afternoon to different collieries in Nottinghamshire, Derbyshire, South Yorkshire, Lancashire, Staffordshire and Warwickshire. After the miners had safely put their wages in lockers at pithead baths before going underground, Clayton forced open the lockers with a screwdriver.

Sentencing him, Mr. T. R. Fitzwalter Butler, chairman, said: "This is a shocking case. You enriched yourself by skilful artifice and careful planning. You did not give much thought to the hardship suffered by these miners' wives and families."

DAMAGES FOR STEEL SMELTER

DAMAGES of £2,500 were awarded in the Court of Session to a Glasgow steel smelter, Mr. William John McCormack (48), against his former employers, William Beardmore & Company, Limited, Glasgow, in whose works, he claimed, he was struck by a piece of hot slag while cleaning out a furnace.

The accident happened last year and the plaintiff maintained that he was exposed by his employers to unnecessary danger.

The firm claimed that it fulfilled all duties incumbent upon it. The accident, it said, was caused solely or at least partly by the fault of Mr. McCormack, who knew he was liable to be struck by falling slag below where it was being removed from the side of the furnace.

DROP HAMMERS "MADE LIFE IMPOSSIBLE"

INJUNCTION to restrain Waterhouse (Manchester), Limited, makers of steel forgings, machinists, etc., from operating drop hammers at Victoria Mills, Keighley, was sought by Mrs. Eva Dawson at Leeds Assizes. On the second day of the hearing Mr. Commissioner Molony, QC, invited counsel to withdraw with him and discuss a possible mutual solution of the action. Later it was announced that the action had been settled.

Mrs. Dawson said that when, in 1956, drop hammers were installed in Victoria Mills life became impossible. The noise from the hammers which were only 170 ft. from the back of her home destroyed her comfort and the vibration damaged her house. She could only bake when the mills were closed. At other times the vibration caused cakes in the oven to "drop."

FOR FAILING to fence securely a power press, D. Warwick & Sons, Limited, holloware galvanizers, Brierley Hill (Staffs), was fined £20 at Brierley Hill Magistrates' Court. The case followed an injury to a woman operator.

FOR FAILING TO HAVE a safe guard on a milling machine in its Atherstone (Warwickshire) works, Townson & Coxson, Limited, engineers' and plumbers' brassfounders, of Birmingham, was fined £21 with £1 17s. 3d. costs, at Atherstone Magistrates' Court. It was stated that the guard used on the machine was inadequate, and a woman operator had injured her hand removing swarf.

QUALITY CONTROL and technical advances in steelmaking will be the general theme of the joint display of Samuel Fox & Company, Limited, and Steel, Peech & Tozer, Limited, branches of the United Steel Companies, Limited, at the Farnborough Flying Display from September 5 to 11.

Ore Chartering

THERE is no improvement from the major loading areas and freight rates continue to have a downward tendency. Quite apart from the general positioning of tonnage, certain districts report a contraction in demand for early loading vessels and immediate prospects, from an owners' point of view, are not particularly bright.

There is very little demand for ore tonnage from the North African coast, particularly for the larger sizes and nothing has been reported fixed to the Continent. On the other hand, there is some small to moderate interest from the West African coast but rates are not attractive. From the Baltic area large tonnage of about 17,000 tons, early loading, has been fixed from Lulea to Gdynia or Gdansk at Sw.Cr. 8.00 f.i.o. and some interest from this area is maintained. Lulea/Poland recently paid 8.50 Swedish kroner f.i.o.t. for two voyages for about 5,800 tons. Indian ore rates have been at 37s. 6d. f.i.o. from Marmagoa/Antwerp-Hamburg Range for July and August/September, both about 9,500 tons, and Marmagoa/Trieste or Rijeka reports similar size at 39s. 6d. on gross terms for August 1/15. Manganese from Poti-Boucau paid 38s. 6d. for 4,200 tons f.i.o. terms.

Vassiliko Bay pyrites to Rotterdam recently paid 26s. 6d. for a 12,000-tonner, August 10/25, Morphou Bay/Ghent, August 1/15, at 29s. 6d. for 6,500 tons and from Spain, Huelva/Antwerp or Terneuzen for late July at 25s. There is only a moderate demand for tonnage to load phosphate from Casablanca to the UK and for second half July 9,000 tons have been fixed from Casablanca to South Africa at 37s. 6d. on gross terms.

New Safety Appliances Company Formed by Becorit (G.B.)

FORMATION was announced recently of Safety in Mines Developments, Limited, a subsidiary of Becorit (G.B.), Limited, with the particular aim of concentrating on safety appliances for use both underground and on the surface. Mr. W. Jackson has been appointed managing director of the company which will operate from 2, Leslie Road, Gregory Boulevard, Nottingham—the same address as the parent company.

Initial products will include the multi-purpose safety trestle, which is adaptable to a variety of uses such as brickwork platforms, conveyor bridges, and scaffolds at ripping lips; telescopic dust carrier shelves, which are self-adjustable to a variety of road widths and comply with underground safety regulations and are quickly and easily installed, and cockermegs or mechanical coal-face sprags which will give temporary roof support and prevent falling coal.

Greater UK-Japan Trade Forecast

TRADE between Britain and Japan should increase by between £3,000,000 and £3,500,000 each way in the 12 months ending March 31, 1961, as a result of new trade arrangements which were agreed last Friday. Britain has granted Japan quota increases totalling nearly £3,000,000 and Japan has embarked on a programme of trade liberalization.

Measures include substantially enlarged global quotas for such items as cars, machine tools, and crawler tractors.

IRON AND STEEL TRADE

IT was not considered likely that the considerable upswing in steel production towards the end of 1959 and in the first quarter of 1960 would continue at its meteoric rate and the June figures are in line with earlier forecasts. The drop, compared with May, assumes little importance when the seasonal factors are taken into account and the Iron and Steel Board's adjustments to put these influences into proper perspective shows that the moderate rate of advance in output is being maintained. What inspires most confidence in the ability of the industry to match its performance to current needs is the total production for the first half of the year of 12,390,000 tons. This certainly accords with the total for 1960, which was estimated at the end of the first quarter at 24,300,000 tons.

Pig-iron

For the next fortnight a good many foundries will be closed down for the annual summer holiday and only the labour required for maintenance and necessary repairs and overhauls will be retained. The opportunity is being taken to carry out a number of major repairing jobs so that production can be resumed after the holiday break.

Most establishments have suspended deliveries of raw materials for the period but the present supply position of pig-iron, scrap, and coke is easy and sufficient stocks are held to avoid any hiatus in working.

Outputs of all grades of foundry irons and hematite are more than adequate to meet present demands and more business could be undertaken.

Ferro-alloys

The holiday influence is now beginning to take effect and there is some slackening off in demand. However, the call for most items is as reasonable as could be expected at this time of the year. The demand for ferro-silicon continues to be at a good level and both the high and low carbon grades of ferro-chrome are receiving steady support. There is a good demand for calcium silicide and ferro-manganese.

Ferro-tungsten remains quiet, but ferro-molybdenum and ferro-vanadium are in fair request. Steady attention is given to ferro-titanium and ferro-niobium is of moderate interest.

Semi-finished Steel

Similar conditions with regard to holidays and production apply to a large number of the re-rollers. There is no necessity to accept deliveries of steel semis during the closure as stocks in most grades and sizes are sufficient for current needs.

The re-rollers maintain good order-books for all their products and outputs are at the maximum levels consistent with the labour available. In a number of cases this is still a major problem.

Finished Steel

There is no slackening in the demand for plates, especially the thinner gauges, but fairly reasonable deliveries can still be obtained for the thicker plates. Re-rollers still have a large back-log of orders to reduce, particularly of the smaller sections, but with the recent improvement in the supply of soft quality billets it is hoped that they will soon reduce their obligations to a reasonable tonnage.

Production of cold reduced sheets is well below current demand, which is being satisfied in part with imports from the US.

Future of Nuclear Power

BRITISH research and development costs on nuclear power plants are of the order of 30 per cent. of the capital expenditure, or about six times as great as the comparable research and developments costs for conventional oil and coal-fuelled power stations, and are likely to remain so until the early 1970s. Sir Christopher Hinton, FRS, chairman of the Central Electricity Generating Board, stated this in his Royal Society Tercentenary Lecture in London on Wednesday.

It was reasonable to aim at continuing this high rate of research and development expenditure, and the resulting advance in nuclear technology, to the point where nuclear power costs broke even with those of conventional power.

Demand for electricity had a doubling period of 10 years and the total fuel requirements of the board (expressed as coal equivalent) was now 54,000,000 tons per year and would rise to 90,000,000 tons per year by 1970. It was improbable, said Sir Christopher, that sufficient British mined coal would be available to meet the Generating Board's total fuel requirements by some date early in the 1970s.

When nuclear power broke even in cost with conventional power there would then be freedom to manoeuvre in a three-fuel economy. "After that date, which is not remote," he added, "it is surely reasonable to think that research on reactor technology should be justified by savings which can be expected to arise from its industrial application."

It was interesting to speculate how much the downward trend in the cost of conventional power could be increased if it could attract as great a research and development effort as its nuclear rival. "There is no suggestion that it should attract such expenditure, but it is suggested that redeployment of research and development resources must be carefully considered."

FOUNDATION TO PROMOTE scientific research is to be established by the Thyssen family, the German steel industrialists. The foundation, to be known as the Fritz Thyssen Stiftung, is to have at its disposal the yield of stock with a market value of more than DM 350,000,000 (about £30,000,000) in August Thyssen-Hütte, a leading steelworks, and in Phoenix-Rheinrohr, the country's biggest maker of tubes. Voting rights of the shares will, however, remain with Frau Amelie Thyssen, widow of Fritz Thyssen, and her daughter, Countess Zichy, who together made the money available.

Non-ferrous Metals

Congo News Affects Copper Price

LONDON copper market continues to be dominated by the situation in the Congo. Prices rose sharply when it was reported that the Union Minière mines had closed, but when the news came through that they would be back in production within a week and that neither the mines nor the refineries had suffered any damage, prices fell even faster than they had risen.

Stocks of refined copper in LME warehouses last week rose by 750 tons to 4,485 tons. The US market continues to experience only routine trading conditions and with production still increasing a condition of overproduction in relation to demand now exists. Nevertheless, the price structure is unchanged with the quotation of 33 cents a pound still applicable to both producers and the custom smelters.

Tin has maintained its firmness in London, in Singapore, and in New York, where the quotation is going towards $1.04 a pound. The overall position is good with world production declining, compared with a consistently high level of demand. The position in the Congo has not affected this market much because there has been no indication that the tin mines have been affected by the disturbances. Last week the tonnage of refined tin in LME warehouses rose further by 319 tons to 9,368 tons.

Zinc is quiet in London but, even so, is a better market than in New York where continued quiet trading conditions have led to a reduction in the premium on special high-grade metal to 1½ cents a pound and the premium on ordinary high-grade metal to 1.35 cents a pound. The US price is unaltered at 13 cents a pound.

Lead is quiet in London and flat in New York where the quotation is unchanged at 12 cents a pound. The underlying weakness of this market stems from the considered fear that the 10 per cent. restriction on availability now in force will be removed in the last quarter of this year with near-disastrous results. Indeed, it is felt that, with this restriction removed and the strong possibility that substantial tonnages may be offered to the market from supplies already built up under the restriction, the market may not be able to cope in an economic manner. In the US the price is still called 12 cents a pound.

Official metal prices in London yesterday (Thursday) were:—COPPER, Standard: Prompt £256 15s., forward £249. TIN, Standard: Prompt £823, forward £823 10s. LEAD: Prompt £71 7s. 6d., forward £72 10s. ZINC: Prompt £91 5s., forward £90 7s. 6d.

Change of Name in Wakefield Castrol Group

TWO changes of name are announced by C. C. Wakefield & Company, Limited, makers of lubricating oils, lubricating equipment and appliances, of London, W.1. The company's trade name Castrol is now so widely known that the family name is to be laid aside and from August 2 Wakefield's will become Castrol, Limited.

The group's recently acquired subsidiary De-Corrosion Services (Norwest), Limited, is to be known as Metal Cleaning, Limited.

Premier Launches Drive for More Exports

APPEAL to 400 businessmen to become "personal canvassers" in a nation-wide drive to persuade more industrial organisations to sell their goods abroad was made by the Prime Minister, Mr. Harold Macmillan, at a meeting on Monday arranged jointly by the Federation of British Industries, the Association of British Chambers of Commerce, and the National Union of Manufacturers. He pointed out that in 1959 Britain was exporting £10,000,000 worth of goods every day—nearly double the pre-war rate. This was an impressive figure, but still not quite enough.

Mr. Macmillan's address was one in a series now being made throughout the country by Government Ministers. The campaign is likely to continue until Christmas, and is aimed principally at persuading non-exporters to turn their attention to oversea markets. Ministers are particularly anxious to see exporters regain some of the ground they have lost to continental and Japanese manufacturers in the sterling areas of the Commonwealth.

A spokesman for the National Union of Manufacturers said afterwards that the union would continue to bring the need for increased exports home to its members and would increase the practical help it already gave. The Federation of British Industries said it was holding a series of conferences throughout the country at which "a new boy can be instructed by experienced people in the field." One meeting had already taken place at Gleneagles, and eight more were planned in leading towns and cities.

Gauge and Tool Makers' Educational Trust

EDUCATIONAL body is to be set up by the Gauge and Tool Makers' Association to provide grants for apprentices, students, and other young members of the industry so that they may further their technical education. It will be known as the Gauge and Tool Makers' Educational Trust and a company—the Gauge and Tool Makers' Trustee Company, Limited—is being formed to act as trustee.

In addition to providing grants, the trust will arrange for the publication of literature to promote general knowledge of and research in the gauge and tool industry. In the same connection it will arrange exhibitions and demonstrations. It will also support and donate money to educational charitable organizations which complement its activities.

The funds have been opened with a gift of £1,000 from Mr. Charles Grundy, who retired a few years ago as managing director of one of the member companies of the association. A substantial sum has been contributed by the association as founder of the trust.

ONE-DAY CONFERENCE on group relations in industry organized by the British Institute of Management in London last week was addressed by Dr. C. K. Ferguson, of the University of California, who explained the US attitude to the relatively new branch of industrial sociology known as "group dynamics." Dr. A. T. M. Wilson, adviser to the personnel division of Unilever, Limited, also spoke about management development and group relations training.

BISRA Steelmaking Conference

ALL-BASIC OPEN-HEARTH FURNACES

Further papers of the session on "All-Basic Furnace Operation" at the 54th Steelmaking Conference of the British Iron and Steel Research Association, held at Harrogate, dealt with experience of faster driving at the Templeborough melting shop of Steel, Peech & Tozer and the performance of the Ajax furnace of the Appleby-Frodingham Steel Company. An exclusive report of these papers is given below.

THE ALL-BASIC FURNACE AND FASTER DRIVING AT THE TEMPLEBOROUGH MELTING SHOP

By H. H. ENGLAND (*Steel, Peech & Tozer*)

THE introduction of all-basic furnaces at Templeborough melting shop has enabled the driving rate to be raised very considerably in the last few years. Since 1948 there has been at least one basic roof furnace operating and the average weekly output for the melting shop has increased from 12,000 tons to 18,500 tons. Recently, with five all-basic furnaces in operation weekly output of over 20,000 tons have been exceeded.

All-basic furnaces have been developed in three phases which may be distinguished as periods of exploration, experimentation, and realization.

Exploration

During the period 1948-57 there was one all-basic furnace in the shop and this was operated like a silica roofed furnace, that is, with the same fuel input rate and same roof temperature control. During this time the brickmakers were endeavouring to produce better and better bricks and the furnace designers all over the world were carrying out various experiments, in other words, everyone was feeling their way.

Experimentation

In April, 1957, it was decided to drive a basic furnace faster than the corresponding silica unit and see what the potential of the furnace was as regards output rate and roof life under these conditions (Table 1). The fuel rate was increased by 33 per cent. (375 gal. to 500 gal./hr.) using twin burners and adequate charging facilities were provided to enable the furnace to use this extra fuel beneficially. This campaign had a roof life similar to that of a normal silica furnace in this shop, namely 193 casts; but the rate of production had increased to 11.4 ton/hr., which was 32 per cent. above the current shop average for that time. There was no increase in the fuel consumption per ton of steel. There was heavy wear in the centre of the roof, probably due to the twin burner firing, and considerable trouble was experienced in maintaining the ends of the furnace, particularly below stage level.

The next campaign on the same furnace, under similar conditions gave a very similar roof life, 195 casts, but the production rate was only 22 per cent. above the shop average, due to the inability to maintain the preferential charging provided in the first campaign. An additional fuel increase of 3¼ gal./ton was also experienced. Wear of the furnace roof was similar, and again there was heavy wear in the uptakes below stage level.

The third campaign on the same furnace used a single burner and a slightly reduced fuel input rate (450 gal./hr.—*i.e.*, 50 gal./hr. less). The resultant roof life was 213 casts, output rate 11·51 ton/hr. and fuel consumption 33.6 gal./ton. During this campaign, the firing rate on the silica furnaces of the shop had been increased and the charging speeded up, with the result that the average production rate on these furnaces had been raised to 9·59 tons/hr. with a fuel consumption of 34·9 gal./ton. Thus this campaign on the all-basic furnaces showed a 20 per cent. increase in production rate over an improved shop average and a 4 per cent. fuel saving over the silica furnaces during the same period.

A summary of these results is shown in Table 1.

TABLE 1.—*Summary of Results of Faster Driving.*

	Faster driving campaigns.					
	First (6th basic roof).	Shop average silica.	Second (7th basic roof).	Shop average silica.	Third (8th basic roof).	Shop average silica.
Life { Tons ..	21,430		21,456		23,616	
Life { Casts ..	193		195		213	
Output rate ton/hr.)	11.4	8.63	10.4	8.54	11.51	9.59
Fuel consumption (gal./ton)	36.0	35.84	40.2	37.36	33.6	34.9
Average fuel input rate (gal./hr.)	410	310	418	319	387	334

It had been concluded that the achievement of a production rate in the third campaign similar to that achieved in the first faster driving campaign, together with a substantially reduced fuel consumption was undoutedly due to the matching of the increased firing rate and the air preheat temperature together with the ability to charge the furnace at the necessary rate. At Templeborough it was now accepted that the correct balance between these three factors determines the success of faster driving. If this balance was not achieved, faster driving became of little value and, indeed, was purely and simply a waste of fuel and an expensive

way of destroying a furnace. If material was not available to charge into the furnace when required, the liberation of additional energy in the furnace raised the temperature of the brickwork and the outgoing gases unnecessarily.

Realization

The success of these three "faster driving" campaigns on an all-basic furnace, coupled with the results of faster driving on silica furnaces had encouraged the company to proceed with the more general adoption of the all-basic furnace. At the present moment there were six all-basic furnaces and by August this year there would be eight. Much interesting work had also been carried out involving the use of single, double, and triple burners, and was being continued. Some very high firing rates had been achieved with the assistance of additional oxygen to burn the fuel.

This oxygen was passed into the furnace through the checkers or at the burner. Much data had been collected and, when analyzed, would doubtless give information of benefit not only to the furnace operator but also to the refractory and fuel experts.

THE EFFECT OF FASTER DRIVING ON THERMAL EFFICIENCY AND ROOF WEAR

By C. HOLDEN (*United Steel Companies, Limited*)

Thermal Efficiency

ALTHOUGH the ultimate aim of any steelmaker is to make steel as quickly and economically as possible, output rate and fuel consumption are not necessarily the best ways of judging the effect of changes in practice. For example, increasing the efficiency of heat transfer may not be a good thing from a metallurgical point of view and similarly a change in the mixture may have its effect on the heat transfer. This is because exothermic reactions within the bath provide an important and in some cases an overwhelming contribution to the total heat required for melting and refining the charge.

Experiments with higher firing rates than normal commenced on the Templeborough melting shop of Steel, Peech & Tozer early in 1957. At that time the normal firing rate used on this cold-charged fixed furnace shop was 375 gal./hr., but during these experiments up to 500 gal./hr. was used with no change in the design of the furnace other than the use of a basic roof and ends and an improvement in the quality of the checker bricks. The use of multiple burners was also investigated as a means of enabling more fuel to be burnt within the same length without the necessity of using more atomizing steam. It was also hoped that an increase in thermal efficiency would be achieved as was predicted in ISI Special Report No. 59[1] where the authors state that the best chance of improving heat transfer is by increasing the bath coverage by the flame. In order to obtain some idea of what might be achieved from these various changes, a number of calculations were made using a slightly modified form of the mathematical model described in Special Report 59, and these are summarized in Table 1.

TABLE 1.—*Calculated Effects of Firing Rate, Preheat, and Number of Burners on Heat Transfer Rate.*

Variable compared.	Firing rate (gal./hr.).	Preheat, deg. C.	Number of burners.	Relative heat transfer rates.
Firing rate ..	375	1,050	1	100
	500	1,050	1	119
Preheat	375	900	1	87
	375	1,050	1	100
Number of burners	375	1,050	1	100
	375	1,050	2	120
	375	1,050	3	130

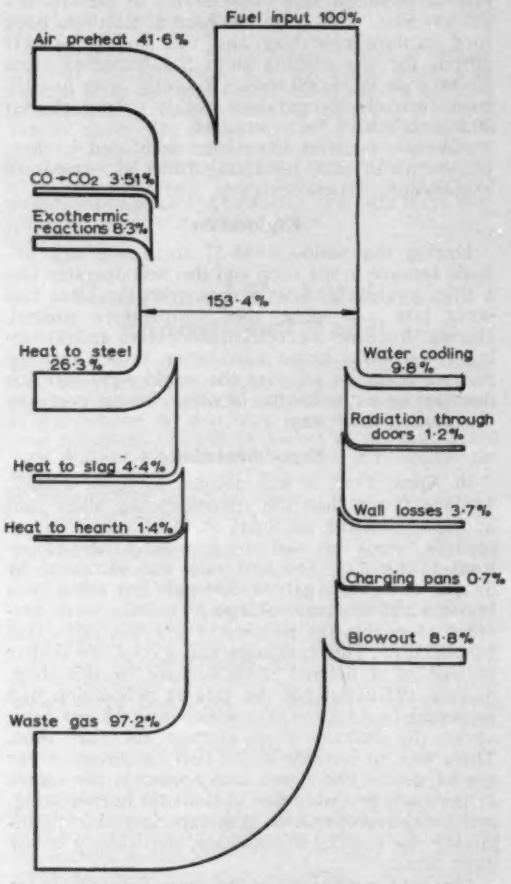

FIG. 1.—SANKEY DIAGRAM FOR CHARGE AND MELT PERIODS FOR ALL-BASIC FURNACE WITH TWIN BURNERS.

It can be seen that theory predicts that a change from single to twin burners at a firing rate of 375 gal./hr. should give approximately a 20 per cent. increase in the heat transfer by radiation and triple burners 10 per cent. more. It also predicts that a drop in preheat of 150 deg. C., reduces the heat transfer by about 13 per cent. which emphasizes the point that firing rates should not be increased without ensuring that the preheat is maintained at a reasonable level. Because of this important effect of preheat a considerable amount of research was made during the trials culminating in the use of baffle walls and flow straighteners in the checkers and flues[2] which enabled preheats of 1,100 deg. C. to be obtained consistently even at the higher flow rates.

Although it can be seen that theory predicts that increases in the firing rate or preheat, or the use of multiple burners should improve the rate of heat transfer, as a check on the predictions it is necessary to measure the thermal efficiency of the furnace and experience shows that this is best made by constructing a heat balance for the charging and melting-down periods. A typical heat balance for the Templeborough furnaces is shown in Fig. 1. Except for minor modification, the heat balance was made according to the method shown on pages 62-64 of the ISI Special Report No. 59. This was for a furnace with a basic roof fired with twin burners at 500 gal./hr. and shows a thermal efficiency, *i.e.*, heat to the steel as a proportion of the fuel input, of 26.3 per cent.

The thermal efficiencies for five heats showing a comparison of single, twin, and triple burner firing are given in Table 2.

TABLE 2.—*Comparison of Heat Transfer Efficiencies for Five Heats.*

Furnace.	F.	F.	F.	N.	N.
Burners	1	2	2	3	3
Roof material	Basic	Silica	Basic	Basic	Basic
Average firing rate, gal./hr.	455	425	470	480	425
Heat to steel and slag from exothermic reactions BTh.U × 10^6	67	56	52	47	48
Net heat to bath, BThU × 10^6	110	115	122	129	130
Average preheat, deg. C.	1,130	930	910	1,085	1,125
	hr. min.	hr. min.	hr. min.	hr. min.	hr. min.
Charging time	3 27	3 55	3 24	3 12	3 31
Melting time	2 29	4 05	3 27	3 10	3 28
Thermal efficiency, per cent.	31	25	26	26	28
Equivalent heat transfer efficiency, per cent.	22	19	21	26	27

As far as thermal efficiency is concerned, the furnace with the single burner and basic roof was the best at 31 per cent. and the triple burner with a high preheat next at 28 per cent., the other three being all about the same at around 26 per cent. There are, however, several influencing factors such as the composition of the charge, the charging procedure and the preheat temperature which profoundly affect the thermal efficiency and a real comparison of the ability of a particular furnace to transfer heat cannot be made without taking this into account. For example, the oxidation rate when firing with three burners was less than with two or one so that to ensure the same margin of melt carbon above specification, less pig-iron was charged resulting in a reduction in exothermic heat.

In order, therefore, to try to compare furnaces on equal terms we have evolved what we call "the equivalent heat transfer efficiency." In the Templeborough O.H. shop this is defined as the heat transfer efficiency which would have been obtained if 120,000,000 BThU had been transferred by the flame to the bath (slag + metal). A figure of 120,000,000 BThU was chosen because it represents approximately the quantity of heat normally transferred to the bath in these furnaces during the charging and melting periods. To calculate the heat transferred from the flame to the bath it is necessary to subtract that arising from the exothermic reactions.

The assumptions made as regards this are that reactions in the liquid state are 100 per cent. efficient, reactions between liquids to form gases 75 per cent. efficient, and reactions in the gaseous state 30 per cent. efficient, *i.e.*, of the same order as the efficiency of heat transfer from the flame. The fuel consumption for the charge + melt periods is then corrected to that required to transfer 120,000,000 BThU assuming that the rate of heat transfer during the latter half of melting down is 12,000,000 BThU/hr., the average for a Templeborough furnace during this period. When the adjustments for exothermic reactions and actual heat transfer are made and the furnaces compared on the basis of their equivalent heat-transfer efficiencies, it can be seen (Table 2) that the heats with triple burners come out substantially better than the rest.

If the mathematical model mentioned earlier is used to calculate the heat transfer from the operating data of these five heats, then it can be seen from Table 3 that, although the absolute values are not as close to those measured in practice as we would like, the trends, apart from the silica furnace with twin burners, are in reasonable agreement. In the case of the silica furnaces with twin burners the low heat transfer efficiency is probably explicable in terms of a much longer charging time which was about half-an-hour longer than normal.

Referring back to Table 1, it would appear that whereas the present form of the mathematical

TABLE 3.—*Comparison between Calculated and Actual Heat Transfer Efficiency.*

Burners.	Firing rate (gal./hr.).	Preheat, deg. C.	Roof.	Heat transfer efficiency, per cent.	
				Calculated.	Actual.
1	455	1,130	Basic	Standard	22
2	425	930	Silica	22	19
2	470	910	Basic	23	21
3	480	1,085	Basic	29	26
3	425	1,125	Basic	28	27

model would predict that twin burners should give 20 per cent. more heat transfer and triple burners 30 per cent. more, the actual increases obtained were approximately 15 and 22 per cent. respectively. This probably means that the assumptions made as to the increased bath coverage were incorrect. Nevertheless, both theory and practice indicate that substantial increases in heat transfer rate can be obtained by conversion to multiple burner firing.

Roof Wear

The use of twin burners on the Templeborough melting shop furnaces caused a marked change in the roof wear pattern. The usual mode of wear of these furnaces when fired with the conventional single burner is pronounced guttering above the back and front wall with a relatively untouched roof centre, as is shown in Fig 2*a*. Conversion to twin burners changed the wear from one of guttering above the back and front walls to severe central guttering (Fig. 2*b*) which made hot patching more difficult. On the first campaign with twin burners and a basic roof it was found that after six and a half weeks a patch was required along the centreline between the first and third doors. A similar wear pattern was also observed with the silica roof installed for the following campaign confirming that the wear was caused by local furnace atmosphere and was not due to any mechanical defect in the basic roof construction.

During these two particular campaigns the burners were set at 8-ft. 6-in. centres and were slightly inclined towards the centreline. Experi-

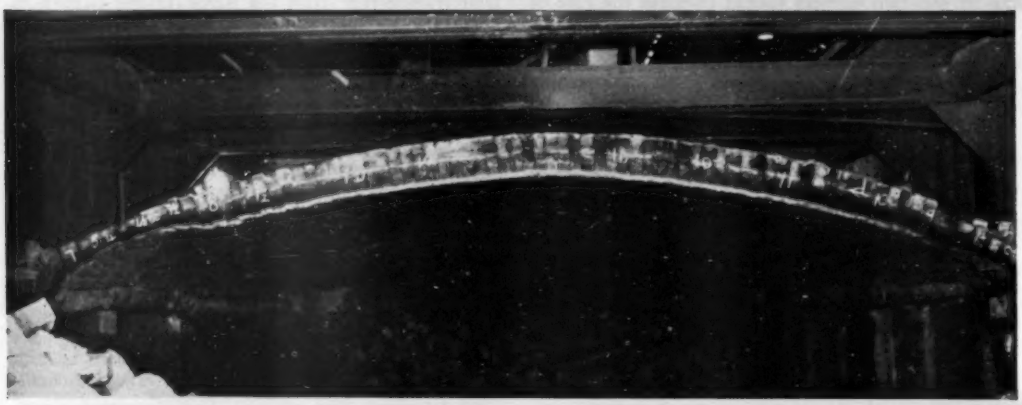

FIG. 2 (*a*).

FIG. 2 (*b*).

FIG. 2.—COMPARISON OF ROOF WEAR WITH SINGLE AND TWIN BURNERS. (*a*) SINGLE BURNERS. (*b*) TWIN BURNERS.

ments were, therefore, made with models and on the furnace itself[3] to determine if changes in burner position had any effect on the distribution of wear. As a result of these trials it was concluded that the optimum setting of twin burners was: pit side 2 ft., stage side 3 ft. 3 in. from the furnace

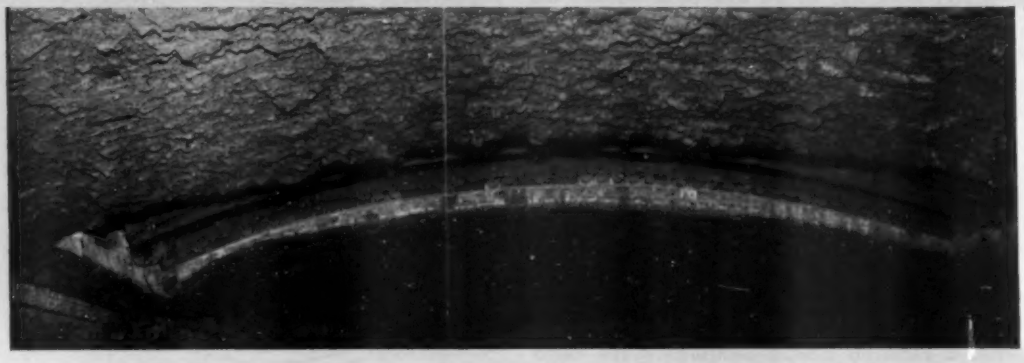

FIG. 3 (*a*).

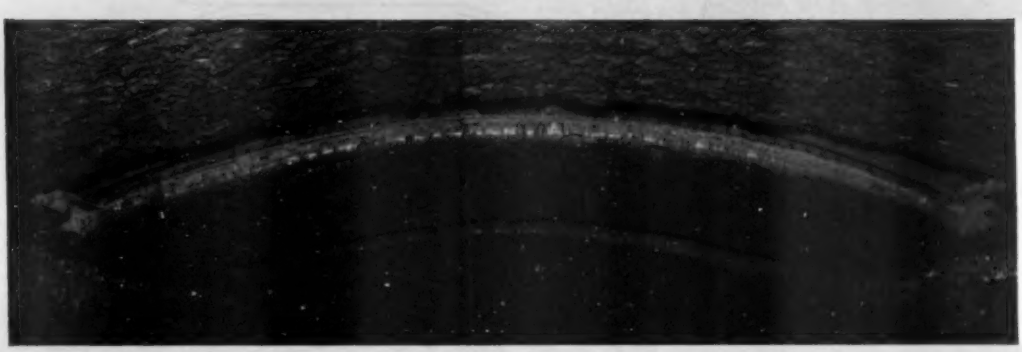

FIG. 3 (*b*).

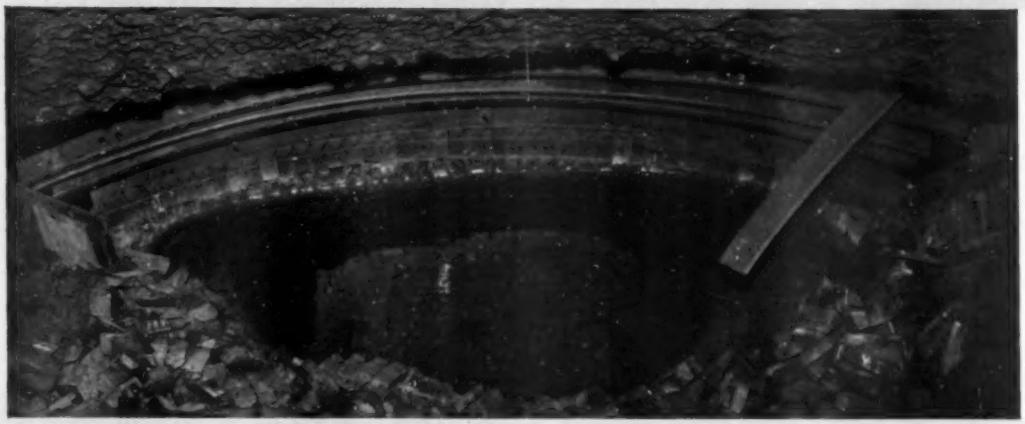

FIG. 3 (*c*).

FIG. 3.—ROOF WEAR WITH TRIPLE BURNERS. (*a*) SHEFFIELD END. (*b*) CENTRE. (*c*) ROTHERHAM END.

centreline and parallel to it. However, even with this improved burner setting there was still severe wear along the centre of the roof.

Model work had shown that three burners did not produce the pronounced recirculation under the central portion of the roof which was considered to be responsible for the excessive central wear with twin burners. Therefore, in the latter part of 1959 triple burners were installed on a furnace in the hope that the enhanced thermal efficiency predicted from theory would be obtained, but without the excessive roof wear so far experienced with twin burners. The centre burner was positioned along the centreline and the two outer ones 3 ft. 9 in. from the centreline and angled slightly towards it. The wear with triple burners was most certainly much less than was experienced with either twin burners or a single burner, as can be seen from the three photographs in Fig. 3, which shows the condition of the roof of this furnace when it came off after a campaign of 19 weeks having made 33,000 tons.

A comparison of the states of wear of basic roofs when exposed to single, double or triple burner firing is shown in Fig. 4. It can be seen that the furnace roof with triple burners had, for the most part, lost less than 3 in. and at no measuring point more than 5 in., whereas at the same time on the furnace with twin burners there was already a large patch where 7 in. had been lost and most of the crown had already worn back by more than 3 in.

It is possible that the different wear patterns could be partially explained on the basis of the difference in roof temperature distribution, as is shown in Fig. 5. With twin burners it can be seen that the area of greatest wear, the roof centre, was on average the hottest spot on the roof, whereas with single or triple burners the hottest spots were towards the back wall, which was also the zone of greatest wear. However, temperature does not by any means explain everything and may, in fact, play the minor role, as there is evidence to suggest that a more important factor controlling the wear of basic roofs is the rate of deposition of iron oxide. Table 4 shows the relative deposition rates as measured by the alumina probe technique[4] for the three different methods of firing.

TABLE 4.—*Relation between Iron Oxide Deposition and Roof Wear.*

Number of burners.	Position on roof	Front.	Centre.	Back.
1	Relative deposition rates ..	94	48	100
	Wear (in./week)*	0.5	0.5	0.6
2	Relative deposition rates ..	46	71	50
	Wear (in./week)*	0.3	0.9	0.3
3	Relative deposition rates ..	57	22	35
	Wear (in./week)*	0.4	0.3	0.4

* First nine weeks of campaign.

It can be seen that whereas with a single burner the highest deposition rate is above the back wall, with twin burners the peak is at the roof centre and with triple burners above the front wall, but in this case the overall rate is much lower. It should be noted that these measurements were for only

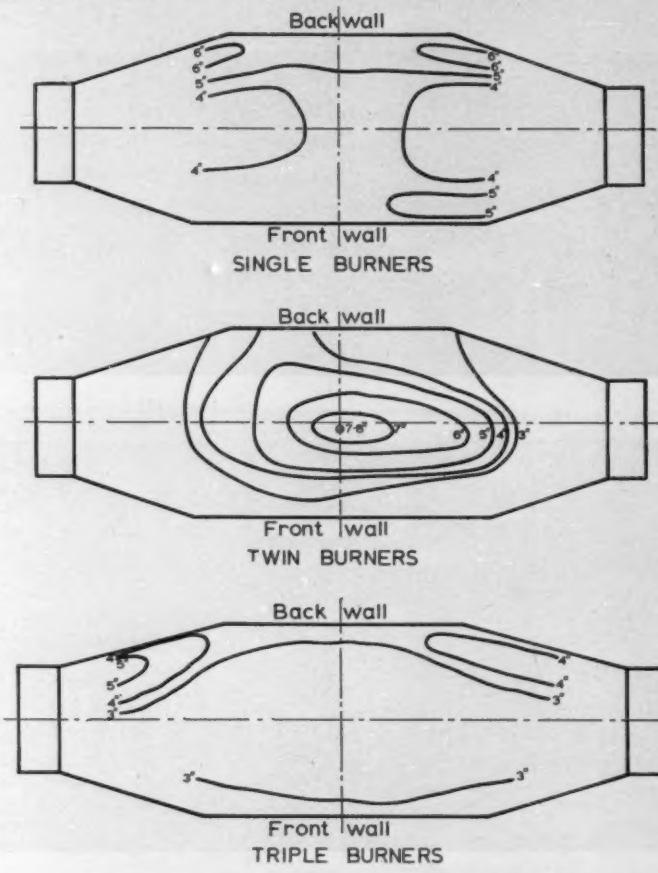

FIG. 4.—ROOF WEAR PATTERNS AFTER NINE WEEKS.

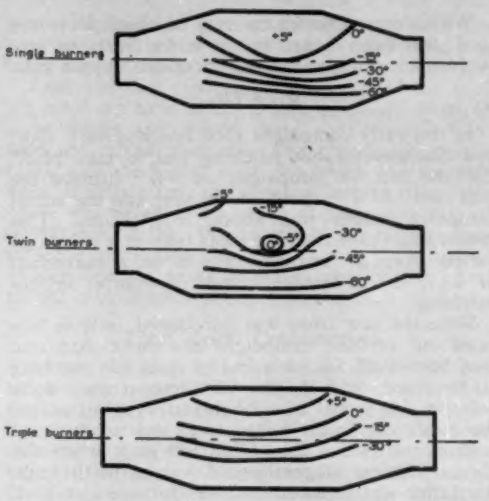

FIG. 5.—ROOF TEMPERATURE DISTRIBUTION DURING MELTING DOWN.

three positions on the roof representing approximately a cross-section above the centre door. For the single burner much higher deposition rates were measured towards the ends of the furnace where the greatest wear was experienced (Fig. 4).

Although the roof with twin burner firing gave a life no better than that normally experienced with single burner firing, the average rate of wear of the roof was less, the limiting factor being exaggerated wear at the roof centre. It is fairly well accepted that recirculation of the burnt gases is mainly responsible for the deposition of fluxes on the furnace roof. Multiple burner firing reduces this recirculation and, according to Table V, the average rate of wear of the roof.

TABLE 5.—*Relation between Number of Burners and Iron Oxide Deposition.*

Number of burners.	Number of surveys.	Average firing rate (gal./hr.).	Relative deposition rates.	Relative rates of wear.
1	2	460	100	100
2	6	470	78	90
3	3	515	43	54

It can also be seen that the relative average deposition rates of iron oxide are in the same order as the relative average rates of wear. Incidentally, the actual average rates of wear were 0.52, 0.47 and 0.28 in./week, respectively. The average deposition rate measured on the furnace fired with three burners was less than half of that with a single burner furnace and the rate of wear was about a half also. Twin burners gave deposition and wear rates somewhere between the other two. When the complicating factors such as temperature and brick quality are considered the comparison is quite striking.

Conclusions

Calculations and heat balances indicate that triple burner firing should transfer heat more efficiently than a single burner using the same amount of fuel. However, they produce a less oxidizing atmosphere and thus, in the absence of oxygen lancing for carbon removal, necessitate a reduction in the proportion of pig-iron in the charge. Hence there is less heat supplied from the exothermic reactions so that on balance the thermal efficiency is no better.

Deposition of iron oxide on basic furnace roofs appears to be one of the important factors determining roof life. The use of triple burners substantially reduces the rate of deposition of iron oxide and gives an increased roof life.

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[2] J. A. Chapman and W. Montgomery: In the Press.
[3] C. Holden and A. Hogg: "The Effect of Faster Driving on Thermal Efficiency and Roof Wear," JISI, January 1960, Vol. 194.
[4] C. Holden: "Factors Affecting Fuming in Open-Hearth Furnaces," JISI, October 1959, Vol. 193.

PERFORMANCE OF THE AJAX FURNACE

By A. JACKSON
(*Appleby-Frodingham Steel Company*)

THE first completely reconstructed Ajax furnace "B" started charging on January 29, 1958, and the second "N" on June 7, 1959. The third will commence operations in a few weeks and the fourth before the end of the year. The following figures apply only to reconstructed furnaces and ignore oxygen lancing done experimentally on the original basic roof standard open-hearth furnaces.

The results are recorded in campaigns, each of which concludes when the furnace roof is completely replaced. It should be noted that all repairs, except for the hearth portion, take place without retarding production in any way.

High Production Gain

The comparative figures for production are obtained by dividing the total number of days the furnace is operating, *i.e.*, from "gas in" when new to "gas out" for general repairs, into the total tonnage produced. In the first 10 campaigns on "B" furnace the average daily production was 620 tons, which compares with 460 tons per day on the standard open-hearth furnace with a basic roof. This shows a production gain of about 35 per cent.

When the tenth campaign started it used a new design of oxygen lance, and the figures have shown a significant improvement because this allowed greater quantities of oxygen to be blown without damaging the roof as seriously as had been the

case with the original lance. A higher production rate of about 670 tons per day has now been obtained on four campaigns with this new lance, giving an increased production of nearly 50 per cent. and a still higher output rate is expected because the oxygen blowing rate has now been increased a further 25 per cent.

When the "N" furnace was built it took advantage of all previous experience on the "B" and, in consequence, started off with a good production and has maintained this same level ever since. Its average rate is about 620 tons per day. Always used previously with a silica roof the average daily tonnage of this furnace was 320 tons, thus its production has been increased by approximately 100 per cent.

Reduced Fuel Consumption

Fuel consumption on both Ajax furnaces has been very consistent throughout the total of 19 campaigns to date, varying from 9 therms in the best campaigns up to about 10.5 therms/ton in the worst. Compared with the fuel consumption on both furnaces previously of 45 to 46.5 therms/ton, this is a reduction to 20 per cent. to 22 per cent. of the former fuel consumption.

Oxygen Consumption

The "B" Ajax furnace has averaged between 1,250 cub. ft. and 1,400 cub. ft./ton during the whole of its two and a quarter years' life. Originally the portion of this used for combustion was about 350 cub. ft./ton, but this has latterly been decreased down to about 150 cub. ft./ton with the lance oxygen proportionately increased. The "N" Ajax furnace has had a somewhat higher oxygen consumption varying from 1,400 to 1,550 cu. ft. in various runs. Of this about the same proportion is combustion oxygen.

When the "B" furnace first went into operation the rate of oxygen blowing was 40,000 cub. ft./hr. for the first 10 runs. When the new type of lance showed itself to be an improvement the blowing rate was increased to 60,000 cub. ft./hr., with consequent advantage to output. Average performance figures for the Ajax process based on 200,000 tons produced recently are given in Table 1.

TABLE 1.—*Performance of Ajax Furnaces.*

Mixer metal (cwt./ton ingots)	21.2
Cold pig (cwt./ton ingots)	nil
Scrap (cwt./ton ingots)	nil
Finishings (cwt./ton ingots)	0.21
Pit scrap (cwt./ton ingots)	0.75
Ore (cwt./ton ingots)	1.73
Slag made (cwt./ton ingots)	3.00
Limestone (cwt./ton ingots)	1.00
Lime (cwt./ton ingots)	0.52
Fluorspar (cwt./ton ingots)	nil
Dolomite (cwt./ton ingots)	0.58
Fuel (therms)	9.0
Oxygen-lancing (cu. ft.)	1,260
Oxygen-combustion (cu. ft.)	150
Power (units)	—
Electrode (lb.)	—
Ton/hr.	29.0
Ton/furnace week	4,875
Availability, per cent.	91.0
Tapping capacity (tons)	200

Within recent weeks the rate has been increased to 75,000 cub. ft./hr., but it is too early to give performance figures for this increased oxygen rate.

Roof Life

In the early campaigns roof life was very short and considerable hot patching had to take place. For the first 10 campaigns on "B" furnace the unit roof life was about 18,000 tons and the actual campaign length was about 26,000 tons. This meant that the number of roofs used in a campaign varied from a minimum of 1.16 to a maximum of 2.17, the difference being, of course, in hot patching.

Since the new lance was introduced, only in two cases out of nine campaigns has more than one roof been used, *i.e.*, only in two cases has patching taken place, and in one of these it was done because, for a trial of roof refractory construction the roof was "split" into two, and as the trial portion still had a lot of life left in it when the normal chrome magnesite end was burnt through, this latter was replaced and the furnace put back into commission.

The most recent roof which followed the new design lasted for a complete run of approximately 50,000 tons and the same kind of roof which is now installed appears to be going equally satisfactorily after about five weeks' life. It can be expected that the roof life of unit roof will now be stabilized at about 50,000 tons.

The brick consumption for the roof alone was 18 lb./ton of ingots in the first 10 runs, but in the last nine it averaged between 6 lb. and 7 lb./ton for the various campaigns and it will be stabilized at this figure in future with the possibility of a slight further advantage when the increased life of the new type roof is included in the overall figures.

It should be noted that the new type of roof consists of burnt magnesite and chrome magnesite laid alternately in each brickwork ring across the furnace roof. The idea is that at high temperature the magnesite brick will contract, while the chrome magnesite will expand due to the absorption of iron, and these two jointly should overcome the difficulty which causes shorter life in all of our basic roofs, *i.e.*, thick pieces shell off the roof at intervals, and these may be anything up to 2 in. thick, and steadily spread across the whole roof.

Our work to date on three roofs indicates very clearly that these mixed magnesite and chrome magnesite roofs do not spall at all but wear evenly over the whole roof and, in consequence, have a much better life. When, however, the bricks are examined closely it is seen that the magnesite bricks are standing out slightly above the chrome magnesite bricks, *i.e.*, the latter are wearing away a little faster, but the pieces at the end are not falling out, but apparently wear away steadily and slightly ahead of the adjacent magnesite bricks.

The early roofs burnt through so rapidly over the lances that they required patching on an average every 10 days and the patch was often bigger than

was really necessary because thicker parts of the roof collapsed when the relatively small hole was being shaped up prior to patching.

After the new type lance was installed the roof life went up to a steady figure of about seven to eight weeks and stayed there consistently. Now with the mixed magnesite and chrome magnesite roofs, and the higher roof rise which has recently been incorporated, it appears certain that this figure will be 11 to 12 weeks at a blowing rate of 60,000 cub. ft./hr. Present trials are taking place to see if increasing the blowing rate by a further 25 per cent. is going to have a significant effect on the overall total production for each roof.

Total Brick Consumption

As the furnace is never taken off to do any below-stage repairs it is difficult to find an end to the campaign of the kind used as standard open-hearth practice. For costing purposes, therefore, refractory usage is calculated at approximately every 1,000 casts, *i.e.*, up to the point when a furnace comes off for the roof repair which is nearest to the 1,000th cast. Table 2 gives former open-hearth consumption and then compares this with successive runs on the "B" and "N" furnace.

TABLE 2.—*Total Brick Consumption. Open-Hearth Furnaces.*

	300-ton O.H. furnaces Mid 1955 to 1958.		300-ton O.H. furnaces 1958 to 1959.
	Silica roofs.	Basic roofs.	Basic roofs (no silica).
Ingots in groups (tons) ..	1,562,785	1,203,158	651,830
Silica, lb./ton ingots ..	26.14	17.81	14.25
Firebrick, lb./ton ingots ..	3.27	4.39	5.94
Magnesite, lb./ton ingots ..	2.08	2.10	1.89
Chrome magnesite, lb./ton ingots	5.88	11.41	11.05
Total	37.37	35.71	33.13
Steel sheets	Nil	0.52	0.50

Ajax Furnaces (all runs to date).

	"B."	"B."	"B."	"N."	"B."
	28.1.58 to 14.5.58.	14.8.58 to 8.2.59.	8.2.59 to 26.7.59.	6.6.59 to 13.12.59.	26.7.59 to 5.1.60.
Ingot in run (tons) ..	95,208	91,830	92,344	101,954	87,016
Ingots per working week (tons) ..	4,105	4,268	4,632	4,689	4,557
Silica, lb./ton ingots	3.68	2.59	1.91	0.57	1.72
Firebrick, lb./ton ingots	1.52	1.70	1.83	0.83	2.96
Magnesite, lb./ton ingots	0.75	0.17	1.00	1.00	2.71
Chrome magnesite, lb./ton ingots	19.83	21.40	15.73	14.10	11.97
Total	25.78	25.86	20.47	16.50	19.36
Steel sheets	1.67	1.70	1.28	0.62	0.82

The figures include running, intermediate, and general repairs, and a proportion of doors and launders.

It will be seen that the Ajax results are considerably better than the ordinary all-basic open-hearth furnace, but the principal difference lies in the major reduction in the use of silica and firebrick, this resulting from the relatively long life of the small checkers in the Ajax furnace which are run as near as possible at controlled maximum temperatures.

DISCUSSION

In the discussion which followed, Mr. Jackson answered many questions, the principal points of interest which emerged being:—

In changing to basic roof construction roof height had been increased, the rise now being 4.6 to 5.1 ft. as compared to 2.6 ft. for silica construction.

Basic bricks of 4½ in. thickness had been tried at Appleby-Frodingham and, from the limited tests made, it appeared that within the range of 4½ to 6 in., brick thickness had no marked influence on brick performance.

The oxygen gun developed at Appleby-Frodingham had three holes in the head arranged at different angles chosen after systematic experiment. The jet from one hole penetrates well into the metal and promotes a large boil which the other two jets attack from the sides so bringing about rapid refining. Taken together, the action of the three jets was such that splashing was reduced to a minimum even for high oxygen flow rates and hence untoward damage of the refractories was avoided.

Training Technicians for Foundries

MODERN techniques in foundries, as in other industries, tend to shift the emphasis from the craftsman's skill, and redirect it to design, planning, and methods departments, and to production and product control. Foundries are therefore feeling a greater need for technicians who may also have supervisory duties. Such men are at present largely recruited from the ranks of outstanding craftsmen and marginally from those who have failed to reach professional status. These sources are proving insufficient and not altogether satisfactory.

A recent study conference held under the auspices of the Training Committee of the Council of Iron-foundry Associations considered the recruitment, training, and education of technical apprentices who would make good this deficiency. The Training Committee is now taking steps to implement the recommendations.

FORTHCOMING EVENTS

AUGUST 4

North of England Institute of Mining and Mechanical Engineers:—Meeting in the Lecture Theatre, Neville Hall, Newcastle-upon-Tyne 1, at 2.30 p.m. "The Mining and Geological Implications of Recent Geophysical Surveying of the Undersea Areas of the Northumberland, Durham, and Cumberland Coalfields," by M. Clark and D. McGraw.

AUGUST 16

Institute of Metals:—Meeting at 17, Belgrave Square, London, S.W.1, at 6.30 p.m. "The Physical Nature of Plastic Flow," by Dr. J. J. Gilman, of the Research Laboratory, General Electric Company, Schenectady, USA.

New Literature

NEW catalogues, booklets, and other publications which have recently been received include those mentioned below. Readers interested in obtaining a copy of any of the publications referred to should apply direct to the address given, at the same time mentioning IRON AND COAL.

J. E. LESSER & SONS, LIMITED, Green Lane, Hounslow (Middx)—Leaflet P.B.4 gives details of the company's flat roof prefabricated buildings.

GEORGE KENT, LIMITED, Luton (Beds)—Publication 2023 is a four-page illustrated brochure on "Instrumentation and Automatic Control of Reheating Furnaces."

METAL INDUSTRIES, LIMITED, Brook House, Park Lane, London, W.1—The fifth edition of the guide to the MI group gives details of the Lancashire Dynamo companies, which are now part of the MI group.

UNITED STATES STEEL CORPORATION, 71, Broadway, New York 6, N.Y.—May issue of the U.S. Steel Quarterly contains the address of the chairman (Mr. Roger M. Blough) at the annual meeting and other news of the corporation.

MUREX, LIMITED, Rainham (Essex)—Articles on "Vacuum Sintering," by Dr. F. G. Cox, and "The Effect of Molten Metals on Stressed Solid Metals," by W. A. Morgan, are the main features of the latest issue of the company's Review.

W. C. HOLMES & COMPANY, LIMITED, Turnbridge, Huddersfield—The Turnbridge News, an attractive little magazine, published quarterly, contains technical articles and news of the company's activities. The summer number is now available.

ENGLISH ELECTRIC COMPANY, LIMITED, Stafford—An article on the new calender and mill installations at the Edinburgh works of the North British Rubber Company, Limited, is one of five articles in the June issue of the English Electric Journal.

ROMAC INDUSTRIES, LIMITED, The Hyde, London, N.W.9.—A section on speedometer cables, hitherto published as a separate catalogue, has been incorporated in the latest edition of the company's cables catalogue for motor-cycles, scooters, mopeds, and cycles.

MAVOR & COULSON, LIMITED, Bridgeton, Glasgow—The story of this famous firm of manufacturers of mining machinery, etc., is being serialized in the M&C Apprentices' Magazine, the summer number of which carries other interesting articles and pages of M&C news.

BAKER PERKINS, LIMITED, Westwood Works, Peterborough—The second issue of the TBE Bulletin, which is published by the company in association with Makhtsavei Israel (Israel Mining Industries), includes an article on "The Early History of TBE and its Use in Mineral Separation."

SWEDISH CHAMBER OF COMMERCE FOR THE UNITED KINGDOM (INC.), 14, Trinity Square, London, E.C.3—Features of the "Anglo-Swedish Year Book" for 1960 are articles on the Swedish steel and mining industries and a wealth of other material of value to those engaged in trade with Sweden.

HEAD WRIGHTSON MINERALS ENGINEERING, LIMITED, 46, Rutland Park, Sheffield—Coal-preparation processes offered by the company are outlined in an attractive new brochure, which also gives a brief picture story of some of the plant and equipment installations for which the company has been responsible.

INSTITUTION OF WORKS MANAGERS, 196, Shaftesbury Avenue, London, W.C.2—Industrialists will find much of interest in Works Management, the journal of the institution. Contents of the July issue include several articles designed to appeal to those associated with the administration of industrial undertakings. The price is 2s. 6d. (postage 6d. extra).

ARMSTRONG WHITWORTH (METAL INDUSTRIES), LIMITED, Close Works, Gateshead-on-Tyne—Close-Up is the quarterly magazine giving news about people and products of the company and its associated company, Jarrow Metal Industries, Limited. "The Development of Electric-arc Furnaces" is the subject of an interesting article, while the third article in the "Roll Types and Applications" series deals with iron rolls.

SPENCER-BONECOURT-CLARKSON, LIMITED, 28, Easton Street, London, W.C.1—"Steam in Industry," a new publication, is to be published three times a year and circulated among the largest steam-using firms in Britain. The first number contains contributions on packaged boilers, waste heat recovery, and boiler maintenance, along with an intriguing account of the part that fire has played in the history of a brewery.

IMPERIAL CHEMICAL INDUSTRIES, LIMITED, Imperial Chemical House, Millbank, London, S.W.1—How does 50-year-old Bernard Taylor come to be heading a team of ICI welders working on a nuclear site in Mol. northern Belgium? That question is answered by Denzil Batchelor in the "One Man and his Job" series of articles in the ICI Magazine, the July issue of which contains a wide variety of interesting features.

RICHARD THOMAS & BALDWINS, LIMITED, 82, Brook Street, London, W.1—"If in 15 years' time the Spencer Works is typical of the whole industry, this would mean that an annual rate of productivity increase in the steel industry of about 5 per cent. would have been achieved," says Sir Robert Shone, executive member of the Iron and Steel Board, in an article on the economic future of steel in the June issue of RTB's quarterly, Ingot.

FEDERATION OF BRITISH INDUSTRIES, 21, Tothill Street, London, S.W.1—Included in the FBI Review for July (price 2s. 6d., post free) is an article by Paul Bareau, City Editor of the News Chronicle, on "The British Economy in Mid-Year"; Mr. Bareau sums up the position: "In spite of contradictory symptons, the economy is as satisfactory as it has been for many years." Other features include "Aluminium for Ships," by Dr. E. G. West, technical director of the Aluminium Development Association.

Combating Noise in Factories

The trend towards more powerful machines is making the problem of noise in factories increasingly serious. In some factories measures are being taken to reduce existing noise levels, but there is much that can be done at the initial stages of design to reduce the noise problem. A survey of the main causes of noise in factories and available methods of reducing it are contained in "Noise in Factories," the sixth in the Department of Scientific and Industrial Research series of Factory Building Studies (Stationery Office, price 3s. 6d.).

MECHANIZATION AT WHITEHILL COLLIERY

Application of 125-h.p. Shearer Loader

By JAMES HISLOP, A.M.I.M.E.*

Installation of a 125-h.p. Magnamatic shearer loader at Whitehill Colliery has enabled an increased output to be obtained from two faces where three would normally have been required. In this paper, presented to the Scottish Branch of the National Association of Colliery Managers on February 3, 1960, the author gives a desciption of the face equipment and the subsequent modifications, outlines the solutions to the difficulties encountered during the installation period, and summarizes the results obtained.

WHITEHILL COLLIERY is situated 10 miles due south of Edinburgh, at the southern end of the Lothians coalfield. Old plans show working in the year 1772. The present colliery started about 1878. The shafts were sunk to a depth of 107 yd. to what is termed locally the Jewel coal, passing through the Great coal, Rough coal, Splint coal, and Parrot Rough coal seams.

Throughout its life, the method of mining coal at Whitehill has altered from stoop and room to "side road" longwall and to longwall conveyors in the early 20s. At this time timber roof supports were replaced by corrugated steel bars and Newbattle tubular props.

In 1944, American machinery was introduced into the Great Seam, including short-wall coal cutters, Joy loaders, and shuttle cars, and operated until 1949, when the longwall system was reintroduced. In 1955, the first shearer loader was installed, followed by a similar unit in 1956.

A scheme was envisaged from 1944 onwards, to eliminate the series of under-rope endless haulages, with 15-cwt. tubs, which was laborious and costly in manpower. A surface mine 3,400 ft. in length was eventually completed to connect to a new locomotive haulage road along the basin of the Great Seam. Drop-bottom mine cars of 3 tons capacity were filled at central loading points, hauled by battery locomotives to the bottom of the mine, and thence in trains of eight, at 8.2 m.p.h., by a 400-h.p. double-drum haulage to the surface bunkers. This reconstruction was completed in June, 1954, and put into operation in July, 1954. The shaft is now used for winding men and for materials required for pumping in the old workings.

Description of Coal Seam and Face

The coal seams worked at Whitehill Colliery are in the true Coal Measures, lying directly above the old Red Sandstone which divides the true Coal Measures from the carboniferous limestone Coal Measures. This small field of true Measure Coals is a shallow trough outcropping about a mile south of Whitehill Colliery and extending northwards to the Firth of Forth. The basin of the Great Seam at Whitehill Colliery is 400 ft. deep and though fairly flat is undulating. Fig. 1 shows the location of the workings in the seam.

The Great Seam at the colliery varies considerably in thickness, as do the dirt bands in the seam. The roof varies from a medium-hard sandstone to blaes and at its worst is a very friable blae, overlain by 10 in. of "cherry coal," which parts keenly from the normal blae roof. The floor of this seam is uniformly a very soft fireclay some 7-15 ft. thick, which necessitates leaving floor coal to counteract prop penetration. Where rough coal and Splint coal have been irregularly worked below, it is necessary to leave a greater thickness of floor coal.

Fig. 2 shows the undulation on the 21's face in which the flight loader is installed; 160 ft. of the face from the main gate is level; it then undulates for some 60 ft., and finally rises at 1 in 12 to the tail

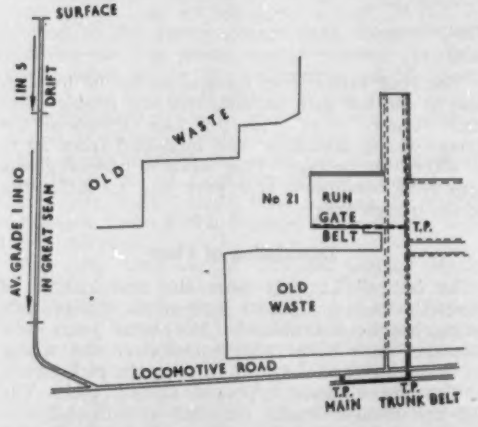

FIG. 1.—LOCATION OF THE WORKINGS OF THE MAGNAMATIC SHEARER FACE IN THE GREAT SEAM.

* Manager, Whitehill Colliery, Lothians Area, Scottish Divisional Coal Board.

DIAGRAMMATIC SECTION OF FACE

SECTION OF COAL SEAM

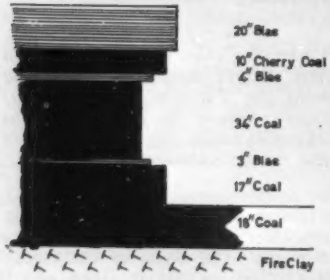

FIG. 2.—SECTION OF 21's FACE AND THE GREAT SEAM.

gate. Table 1 indicates the variation in the seam section from the main to the tail gate. On the line of advance the roads are level. There is no well-defined cleat in this area.

TABLE 1.—*Variation in Section of the Great Seam.*

Main gate		Tail gate.		Remarks.
	in.		in.	
Coal	3			
Clay	3	Coal	9	Roof
Coal	20	Coal	30	
Blae	2			
Coal	17			
Clay	2	Clay	3	Marker band
Coal	7	Coal	17	
Working height ..	54		59	
Pavement coal ..	18		12	
Total thickness ..	72		71	

The roof varies from normal sandstone to blaes and at the tail gate includes the soft friable blaes and "cherry coal." As the face advanced the extent of the sandstone roof increased from 50 ft. to 400 ft. up the face. This, while in general giving improved conditions, still gave rise to difficulties in the trough area.

Description of Plant

As is well known, since the introduction of Anderton shearer loaders into mines, the product sizing has been criticized. For some years now attempts have been made to improve the sizing, by designing special drums, altering the pick lacing, and trying different types of cutting pick. The 125-h.p. shearer loader installed at Whitehill was the first machine of this type built by the British Jeffrey-Diamond Company, Limited. In designing this, the manufacturers aimed at producing a faster haulage speed while shearing, to improve the product sizing.

Whitehill was chosen for this installation since there was an efficient transport system; an enthusiasm and aptitude for mechanization in both men and management, and shearer loaders have been successfully applied since November, 1955. It was anticipated that with this machine, in addition to improved sizing, a greater bulk output per shift could be obtained from the same face length, with consequent improvement in productivity.

The motor, of British Jeffrey-Diamond design and manufacture, is 125 h.p. continuously rated, water-cooled, suitable for 3-phase 50-cycle supply at 500-550 volts. A water jacket encircles the stator and includes baffles to ensure efficient distribution of the coolant.

The stator has former-wound Class "B" insulated coils, which are fully insulated before assembly into open-type slots. The winding has thermostatic protection. The double squirrel cage rotor has an outer cage immediately outside the inner cage and is designed for maximum starting, accelerating, and running efficiency. The rotor is carried in grease-lubricated roller bearings in end shields which are located by spigots in the stator frame.

The 250-amp. starting switch is of the contactor type, 3-phase reversing, employing snap action contactor units complete with arc extinguishing features. The speed of make and break is independent of the action of the operator and the switch is fully sequenced electrically and mechanically to operate in conjunction with all types of gate-end boxes. The contactor switch can be removed from the motor as a complete unit.

Three subsidiary switches are incorporated in the motor switch unit for the following purposes:—

(*a*) Emergency stop switch, chain operated externally from the side of the machine.

(*b*) Water pressure switch, set to shut down motor automatically if water supply fails; the time-lag on this switch is 7 sec. This switch can be removed as a complete unit for inspection and overhaul.

(*c*) Shearer unit interlock defeat switch, enabling machine to flit back with water supply cut off.

Magnamatic Transmission

The Magnamatic transmission has two separate hydraulic circuits. The main circuit consists of a variable delivery pump and a radial piston hydraulic motor. The speed of this motor is controlled by varying pump displacement. Pump displacement can be controlled manually, but is automatically controlled between the manual speed setting and zero.

An electromagnet is connected in series with the main electric motor and is set to operate at a predetermined current. When this current is exceeded owing to harder cutting, the magnet closes and actuates a valve in the auxiliary hydraulic circuit. The valve operates a hydraulic thruster which reduces the displacement of the pump in the main circuit and thus reduces the speed of the

hydraulic motor, the output shaft of which is connected through gearing with the haulage drum. As the rate of travel falls, owing to a reduction in the rope speed, the current demand consequently falls, the electromagnet opens, the valve is returned towards the original position, and the machine speeded up. Consequently, the speed of travel of the machine is adjusted automatically with fluctuations of load as the machine traverses the coal face. At the same time, it will not exceed the manually selected speed.

The first reduction gears are housed in a separate gearbox, bolted to the electric motor, and comprise the motor pinion and its mating gear, the latter slide mounted for engaging and disengaging the drive to the drum, the control handle being positioned on the waste side of the machine. The main gearbox is split horizontally and so arranged that it can be turned completely over to suit either hand of face. The disc-driving shaft, which is offset to give a 3-deg. lag, is tapered to carry the cutting disc unit.

The shearing disc unit consists of a hub to which are bolted disc shells with pick holders of the usual pattern. Paddles are welded between the pick boxes to prevent recirculation and further degradation of coal. The plough is made of fabricated steel and is so shaped that the cut coal is turned on to the conveyor as the machine cuts along the coal face. When ploughing back, the coal in the path of the plough is swept up the wedge-shaped portion and deflected on to the conveyor.

The controls, shown in Fig. 3, are as follow:—(*a*) Emergency stop push, coloured red, to stop the rope drum; (*b*) motor switch handle—this has to be turned right over, *i.e.*, through 180 deg. to the "on" position; (*c*) reverse switch; (*d*) manual speed control and indicator; (*e*) oil pressure gauge for hydraulic systems; (*f*) water control valve; (*g*) chain-operated emergency switch—cuts off current.

The water supply is brought direct from the surface to the face in 3-in. Unicone pipes. Water for the shearer loader is fed by ¼-in.-dia. rubber hose in 60-ft. lengths. The head is gravitational and is approximately 165 lb./sq. in.

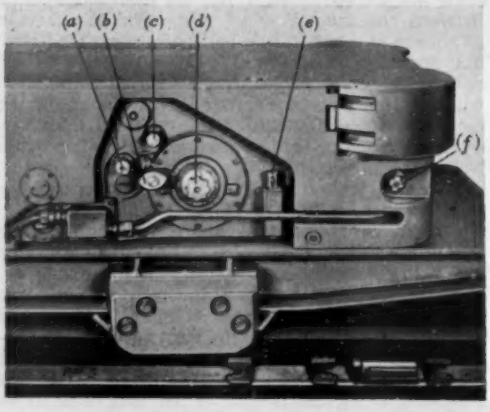

FIG. 3.—CONTROLS OF THE 125-H.P. MAGNAMATIC SHEARER LOADER.

The shearer loader is fitted with a reducing valve regulating the pressure of the cooling water supply to the motor to not more than 70 lb./sq. in.; this valve cuts out and trips the electrical supply to the shearer loader after a time lag of 7 sec. if the pressure of the water supply falls below 30 lb./sq. in. This water supplied for cooling purposes is dispersed through the dust-suppression sprays at the cutting end of the shearer loader.

Associated Equipment

As the shearer loader is designed for a high cutting speed, giving a rate of loading of 240-300 tons per hour, a 30-in.-wide armoured face conveyor was essential. Another consideration was that, with a conveyor of this width, more stability would be obtained for the shearer loader at fast speeds.

The adoption of a triple-strand chain was considered necessary for this extra wide conveyor, so that bending of the flight bars would be reduced. The conveyor used was an adaptation of the BJ-D C 20, 24-in.-wide armoured conveyor, powered by two 50-h.p. flameproof motors, with Class "B" windings and external fan cooling, one at each end, driving through fluid couplings, to give a chain speed of 120 ft./min. A ratchet-pulling-over device was fitted to both drive units, to assist and speed up the move over of the conveyor at the end of each cutting cycle. The overall dimensions of the drive frames are:—height, 24¼ in.; width, 5 ft. 4 in.; length, 7 ft. 6¼ in. The line sections are 7⅞ in. high and 36 in. wide, including spillplates. Spillplates with a double decked cable duct are fitted along the full length of the waste side line sections.

The Evans hydraulic pump has a capacity of 4.8 gal./min. at a maximum working pressure of 1,000 lb./sq. in. Driven by a 5-h.p. motor, the pump is working on an open circuit. Water is supplied to the pump storage tank from a ½-in. valve on the 3-in. water supply column. To this tank, soluble oil in the proportion of 50 parts water to one part oil is added for two purposes:—(*a*) To lubricate all seals, glands, pistons, leathers, and (*b*) as an anti-corrosive measure.

The pump supplies the water and oil mixture at 1,000 lb./sq. in. to a column of ½-in. internal dia. double-wire braid Gullick hose running the length of the face, from which T-pieces make the connection to the rams.

The rams used on the face are Gullick Mark 1A Type. These rams are supplied from the main line T-pieces through 3-ft.-long, ¾-in.-dia. hoses. There are 37 rams on the face, each situated in a ram stell and bolted to the spillplates by clevis joints. Four rams are grouped together at 5-ft. intervals in the vicinity of the main-gate stable, to assist in ramming over the shearer loader at the end of a cycle. The remainder of the rams are at 15-ft. intervals along the face.

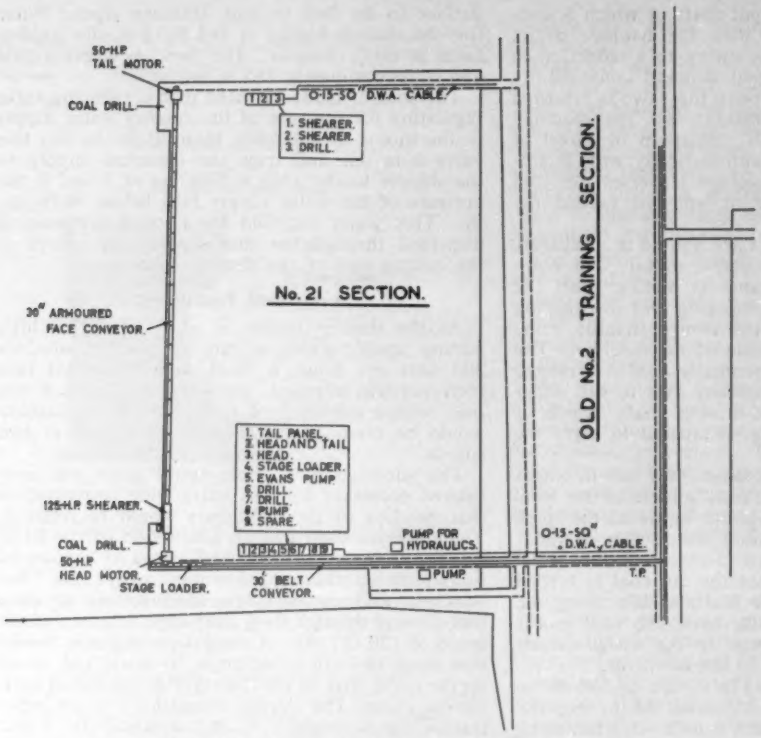

FIG. 4.—LAYOUT OF ELECTRICAL EQUIPMENT.

The ram stells, made by Hope Bros., have an extensible arm to accommodate varying roof heights and a spring-loaded back stay to keep the arm in contact with the roof during retraction of the ram.

The electrical equipment on the face (Fig. 4) is supplied from two separate 250-kVA transformers, 3,300/550 volts, situated on the main locomotive haulage road. This arrangement was considered necessary because of the very high starting current anticipated with the shearer loader. One circuit feeds the shearer loader, tail-gate drill unit, and tail-gate supply haulage by a 0.15 DWA cable, the other circuit feeds the main gate conveyor belt, main gate pumps, stage loader, main-gate drill unit and face conveyor also by a 0.15 DWA cable.

The shearer loader trailing cable is a 6-core individually screened cable having an overall dia. of 2.045 in. for which exemption is required. The tail-end motor cable is carried in the lower duct of the face conveyor spillplates.

The haulage rope used with the shearer loader is a round strand Monarch Special improved plough steel with a tensile strength of 100-120 tons/sq. in. ungalvanized, Langs right-hand lay, $\frac{13}{16}$ in. dia. with a normal breaking load of 26.2 tons. The rope is secured to the head and tail gearheads of the armoured face conveyor by Macdonald winches (Fig. 5).

System of Support

As with the standard shearer loaders, it was necessary to have stables, each 30 ft. long and won from the solid at the ends of the face. Exemptions were obtained from the requirements of Regulations 6 and 8 of the Coal and Other Mines (Support) Order, 1956, on the following conditions:—

(1) That each bar shall be supported at all times as effectively as practicable by one or more supports, and that the supports and bars are of the type specified, *i.e.*, Huwood TCR Type II friction props (41 to 71 in.) and GHH type TZG/70 bars (1 m. long), and that every bar is itself linked to another such bar.

(2) (*a*) That the interval between adjacent rows of props shall not exceed 1 ft. 6 in., except in the area of roof to be supported over the conveyor gearheads where the interval shall not exceed 6 ft.; (*b*) that the interval between adjacent props in the same row shall not exceed 5 ft. 4 in.; (*c*) that the interval between the front row of props and the face at any place at which filling had been completed shall not exceed 6 ft.

Huwood TCR props were used in conjunction with GHH bars on the power-loaded section of the face. TCR props in conjunction with 12-ft. by 3-in. by 3-in. H-section girders on double slide-bar heads were used in the stables. A staggered line system of support, without chocks along the waste edge, was adopted for the following reasons:—

(*a*) Whitehill Colliery had settled down to a practice with standard-type shearer loaders, in which the straight line system of support, with Dowty or Butterley chocks along the waste edge, was uniform. Two cuts being taken on the coaling shift and the withdrawing and moving forward of supports on another shift, a more or less cyclic system had developed and a complete change of system was indicated if increased rate of advance was to be achieved.

(*b*) With an anticipated advance of over 6 ft. per shift a large area of roof would require to be supported and unless withdrawal was carried out

on the coaling shift an excessive number of props and bars would be required on the face.

(*c*) By the use of breaker props set between the waste props of a staggered system it was considered that chocks were unnecessary.

(*d*) With such a system continuous mining could be better achieved.

Initial Installation

The original faceline was laid out with a ribside conveyor road at 60-ft. centres from the main gate so leaving the main gate free for ripping on any shift. A 24-ft. ribside was carried from the tailgate. This layout had a face 600 ft. long overall, so that in this period the shearer loader was working on 540 ft. of face.

The ribside conveyor was used in conjunction with a crosscut conveyor so elevated that this conveyor loaded in turn on to the main gate conveyor belt, by means of a turn chute, giving "in line" loading. A similar chute was installed at the main-gate transfer point. These chutes were designed by the mechanical engineering department, and are proving very satisfactory.

Experimental Period

By April 1, 1959, the shearer loader and ancillary equipment had been installed and were ready to begin operations. A machine operator and cableman had been chosen to be trained on the machine by BJ-D demonstrators. The remaining men used were those who had developed the

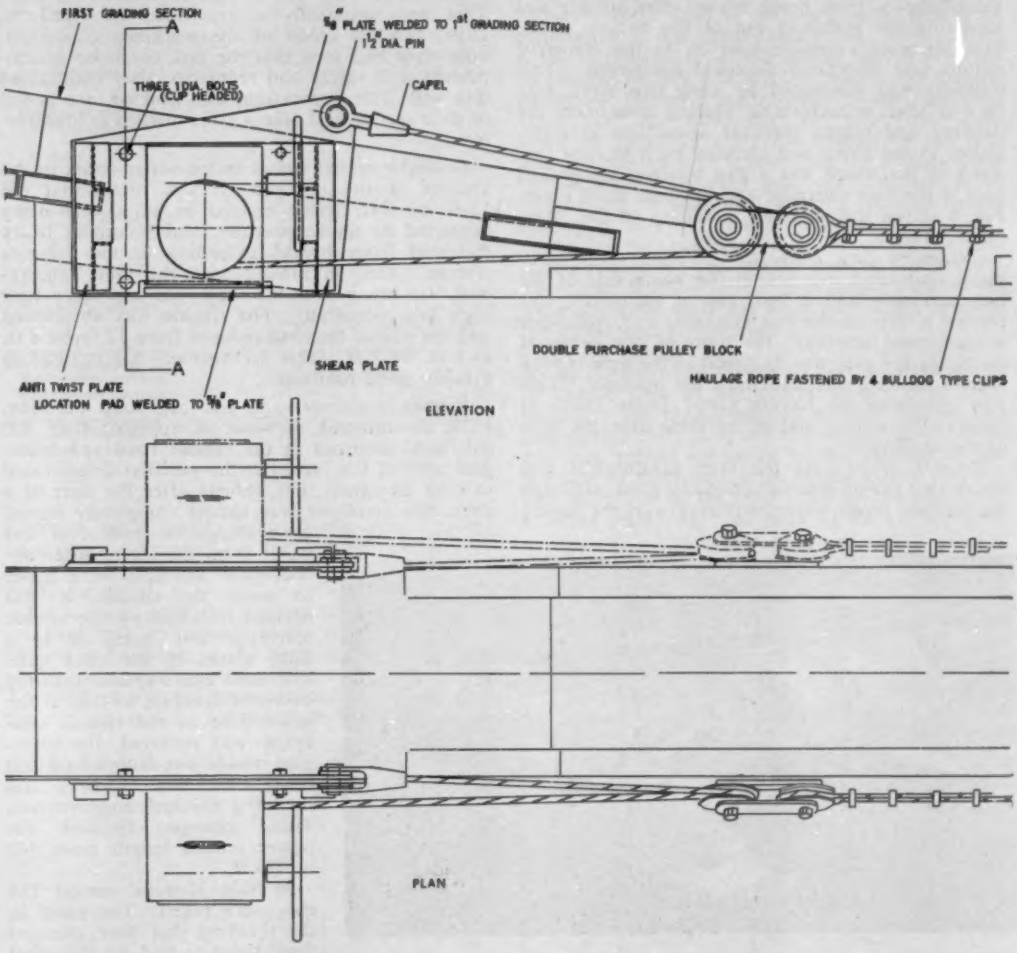

FIG. 5.—DIAGRAM SHOWING WINCH-FASTENING ARRANGEMENTS.

section, the mechanization teams, and any spare men left after the colliery had been manned up.

In this period no definite task was set, but, by taking time studies, a good idea of the performance of the machine was gained. At the same time the weaknesses in the organization were discovered and corrected. These were mainly:—

Spillage.—As the shearer loader was averaging 30 min. to cut 520 ft., or an average speed of 17 ft./min. with a 20-in. web the rate of loading was in the region of 260-300 ton/hr., so that the 30-in. wide conveyor belts were being fully taxed to carry the peak loads. Ribside and cross-cut conveyors were completely equipped with spillplates and conveyor chains renewed.

Moving over armoured face conveyor.—Due to firing the stables from the solid, the floor in this area was very often uneven and ridged, preventing the gearheads from being pushed over quickly and hindering the gumming out of the bottom chain, thus throwing excessive load on to the conveyor motors and associated electrical equipment. This difficulty was eliminated by using two 10-ft. 4-in. by 4-in. joists in each stable, placing these under the delivery and return sprocket assemblies at right-angles to the chain and carrying each in turn forward so that there was a gap between the graded part of the face conveyor and the floor at all times. Fig. 6 shows the modified mounting of the 30-in. face conveyor.

Design of face conveyor spillplates—The spillplates and cable carriers on the waste side of the face conveyor had a 2-in. gap at the joints; this formed a trap for the machine cable and, with such a high-speed machine, the loop of the cable, if caught in the gap, was damaged in the time it took to pull the bell wire and warn the operator. This was overcome by having clevis joints made at Central Workshops and fitting these over the gaps in the spillplates.

Breaker props.—As the face advanced it was found that caving was exceptionally good, although the breaker props were interfering with the caving and delaying the cycle. They were dispensed with and the spacing between lines of props was reduced from 2 ft. 6 in. to 2 ft.

Attitude of wastemen.—Though the workmen at Whitehill Colliery had shown a ready enthusiasm for mechanization, the idea of withdrawing supports when the conveyor was running and the machine operating was not well received. This, coupled with the fact that no chocks were to be used and the "bangs" that TCR props can make when yielding gave the management a problem. This was overcome by splitting the wastemen into teams of two men, each team having its own stent to support and withdraw, the stents being 88 ft. long initially. By using the mechanization team and available officials each team was supervised, so that by the end of the month it was felt that an effort should be made to take four cuts in a shift. This was successully accomplished on April 30, 1959. To the credit of the workmen concerned, once they had seen that the task could be accomplished with safety and regularity, they maintained this with little supervision and, indeed, are proud of their section and take a great interest in improvements.

Crushing of tail gate.—In the softer strata in the vicinity of the tail gate, it was found that the 12-ft. by 8-ft. arches erected on stilts were being subjected to severe pressure, and becoming badly distorted from breaks extending to the tail-gate ribside. This, in turn, caused the thin "cherry-coal" to break over the road roof and some very high falls occurred. The ribside was abandoned and the size of the road reduced from 12 ft. by 8 ft. to 8 ft. by 7 ft. This arrangement has resulted in a fairly good roadway.

Ribside conveyor.—At the beginning of May, 1959, an outbreak of water of approximately 300 gal./min. occurred in the ribside road and maingate area of the face, but the position deteriorated to such an extent that, shortly after the start of a shift, this conveyor was almost completely buried by a sludge of small coal and water from the face. After unsuccessful attempts were made to work the ribside, it was decided to withdraw the ribside conveyor and install it as a stage loader in the main gate. The main gate was also distorted over this distance, so that at the same time as the ribside conveyor was removed, the maingate ribside was dropped off and since then this roadway has shown a marked improvement. These changes reduced the power loaded length from 540 to 480 ft.

In this 17-week period 114 cuts were taken. The gears in the shearing unit were changed three times to find out the effect of drum speed on the product, details of which are given later.

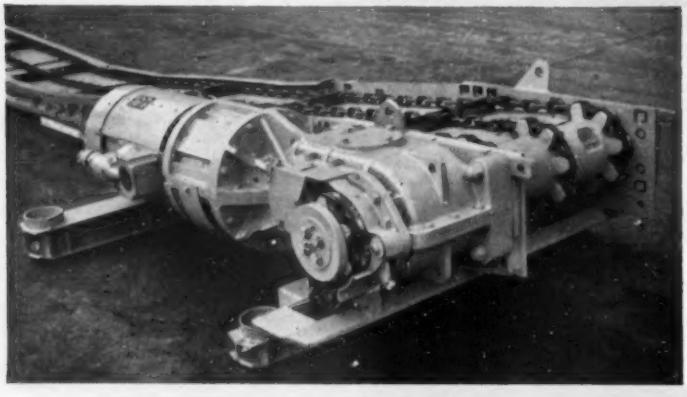

FIG. 6.—TRIPLE CHAIN, 30-IN. ARMOURED CONVEYOR WITH MODIFIED FLOOR MOUNTING.

Operational Period

No. 21 face was started as a production unit on Monday, August 10, 1959, and to date has operated successfully. The manpower deployment is shown in Table 2.

Both roads having been ripped up to the face conveyor gearheads, the shearer loader being in position at the main gate stable, picks having been renewed as required, and all conveyors having been run and tested by the second preparatory shift before leaving the face, the cutting shift is ready to start.

Each stable crew has its own leader; the stables are kept 6 ft. in advance of the machine face, are blasted in readiness at the beginning of the cutting shift, and are left bored at the end of that shift. The fifth man in the main-gate stable is responsible for the winning out for the stage loader extension.

TABLE 2.—*Manpower Deployment for 21's Face.*

—	Face.	Elsewhere underground.
Cutting Shift		
Machine operator	1	—
Cableman	1	—
Main-gate stable	5	—
Tail-gate stable	4	—
Wastemen	12	—
Tracker and grader	1	—
Shotfirers	2	—
Face conveyor operator	1	—
Steel checker	1	—
Conveyor operators	—	4
Materials supply	—	2
General worker	—	1
Overman	—	1
Deputy	—	1
Mechanical engineer	—	1
Electrical engineer	—	1
Total	28	11
First Preparatory Shift		
Main-gate rip	5	—
Main-gate pack	1	—
Tail-gate rip	3	—
Tail-gate pack	1	—
Shotfirer	1	—
Conveyor cleaning	—	2
Deputy	—	1
Mechanical engineer	—	1
Electrical engineer	—	1
Total	11	5
Second Preparatory Shift		
Face conveyor grader	1	—
Stage loader extension	1	—
Deputy	—	1
Mechanical engineer	—	½
Electrical engineer	—	½
Belt maintenance	—	2
Total	2	4

At the end of every cycle this man and the cableman move into the two stents nearest the main gate stable to assist in the support of this area, to minimize the time that the shearer loader is idle in the stable.

The 12 wastemen are split into six teams of two men, and are allocated their own stent of 80 ft. Their task is to withdraw 16 props and bars per cut as the shearer loader is cutting up, to erect bars over the new cut, to snake the face conveyor in their own stent as the shearer loader ploughs back, and to set the new line of props close up to the face conveyor ready for the next cut.

Because of the weak floor and natural undulations associated with the Great Seam, some 12-18 in. of floor coal is left to give a base for the props. As can be appreciated, advancing at the rate of over 6 ft./shift, a slight dip or rise on the face conveyor could lead to serious trouble with floor penetration if not strictly controlled. This control is the responsibility of the grader and is achieved by using 12-in. by 3-in. by 2-in. soft wood wedges, which are placed at right angles to the face conveyor in the new cut to raise the conveyor by ramming it up the wedges on the face side or lowering it by hammering the wedges home on the waste side. Any head coal that has to be taken down or additional securing required during cutting is also this man's responsibility.

The overman is employed on the cutting shift and is responsible for the section over all three shifts. The three deputies follow their appropriate shifts, while the three shotfirers work such shifts to cover the stable and ripping firing.

On the cutting shift an electrician and mechanic are in constant attendance for any emergency and to ensure that all equipment is operating satisfactorily. The electrician and mechanic on the first preparatory shift carry out the routine maintenance and any repairs necessary to the equipment; the function of those tradesmen on the second preparatory shift is to be on hand while all the equipment is being tested and run prior to the cutting shift.

Operational Results

The operational results obtained during the period August to December, 1959, are shown in Table 3.

Any loss of output or reduction in the number of cuts below 20 in any week has not been caused by defects in the machine or face conveyor.

While using a 50-in. dia. drum the length of the props was critical where head coal had to be left

TABLE 3.—*Operational Results of the Shearer Loader at Whitehill Colliery.*

Month.	Number of days worked.	Face advance (ft.).	Number of cuts taken.	Advance per cut (in.).	Output (tons).	Face manshifts worked.	Face o.m.s. (cwt.).	Face manshifts per 1,000 tons.
August	20	98.25	60	19.65	8,948	782	228.8	87
September	24	145.50	89	19.62	13,600	1,002	271.5	74
October	19	122.25	76	19.30	11,485	775	296.4	67
November	19	122.0	75	19.52	11,893	765	310.9	64
December	22	139.5	85	19.70	13,633	878	310.5	64
Total	104	627.5	385	19.56	59,559	4,202	283.5	71

N.B.—Excluding shotfirers.

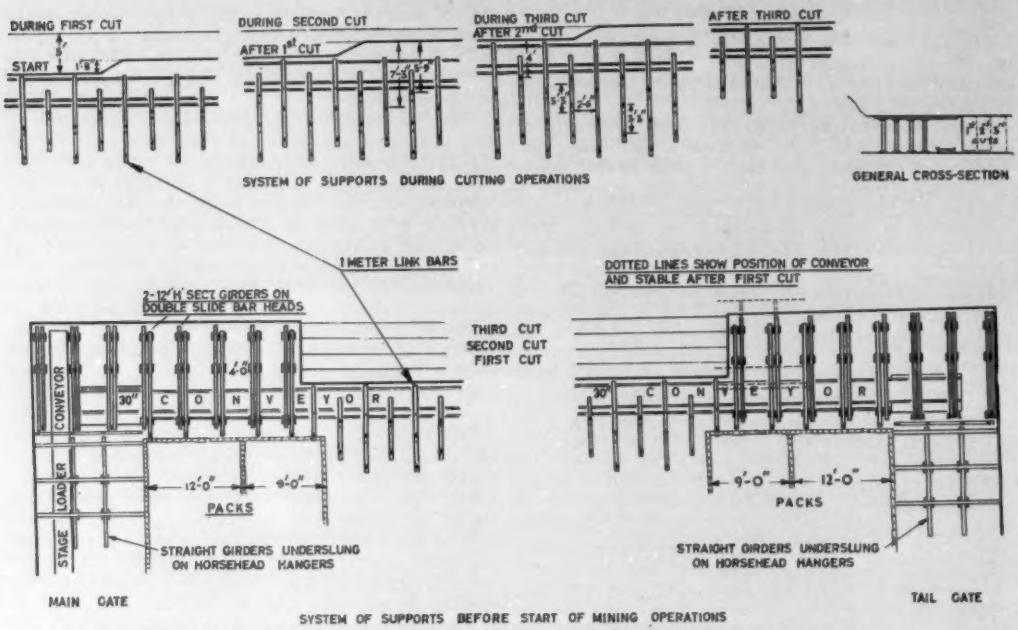

FIG. 7.—SUPPORT PLAN WITH REVISED SUPPORT FOR THE MAIN AND TAIL GATES.

on, resulting in difficult withdrawal. In September, 1959, it was decided to fit a 56-in. drum of similar type, which was better suited to the length of the props and also gave a 12 per cent. increase in output. Unfortunately, the larger drum reduced the cutting speed and, because of the greater peripheral speed, increased the dust concentration on the face. Ten days later, the coal thinned for 150 ft. at the tail end of the face. Having less floor coal, penetration occurred causing a general deterioration and a fall on the face. The 56-in. drum was then withdrawn after only three weeks in operation. Since then conditions have never warranted its reintroduction.

The original supports rules plan was found to be difficult to apply as the three different types of support caused confusion among the stablemen. A system using 12-ft. by 3-in. by 3-in. girders in twin slide-bar heads has been introduced successfully (Fig. 7).

After finding wear on the shearer loader haulage rope after 80 cuts, it is now the practice to renew the rope every four weeks. A spare rope is kept on a reel in the tailgate in case of emergency.

Maintenance of the purity of the hydraulic fluid is essential, and, in consequence, the hydraulic fluid is completely changed each four weeks at the same time as the haulage rope is changed. Once a week a time study is made of the cutting speed of the shearer loader as it traverses the face in order to check that the performance is up to standard. A comparison of the speeds of travel between the 125-h.p. and a 100-h.p. shearer loader, fitted with a Heeley drum, is given in Table 4.

TABLE 4.—*Comparison of Average Cutting and Ploughing Speeds (Adjacent Faces).*

Location on face (ft.).	Cutting speeds in ft./min.		Ploughing speeds in ft./min.	
	BJ-D 125-h.p. Magnamatic shearer loader.	100-h.p. hydraulic shearer loader.	BJ-D.	100-h.p. hydraulic shearer loader.
Main gate to 60	21.17	10.0	—	—
60 to 120 ..	12.4*	9.8	—	—
120 to 180 ..	15.65	10.3	—	—
180 to 240 ..	17.13	10.3	—	—
240 to 300 ..	27.61	10.2	28.60	12.9
300 to 360 ..	18.0	10.0	—	—
360 to 420 ..	17.13	10.0	—	—
420 to tail gate ..	17.13	9.9	—	—
Average ..	18.28	10.08	—	—
Time taken for traverse (min.)	26.25	48.0	16.78	37.9

* Machine passing through undulation of the seam.

Product Size Tests

One of the aims of this high-powered shearer loader was to increase the percentage of the larger sizes of coal and reduce the percentage of fines in the overall product.

Accordingly, a programme was drawn up with the shearer loader manufacturers and the NCB production and scientific departments to make a series of tests for product size as the drum shaft speed was increased by increments of 10 r.p.m.

TABLE 5.—*Product Sizing Test on 125-h.p. BJ-D Shearer.*

Size.	Whitehill conventional 50-in. disc, shearer (per cent.).	No. 1 Test 50-in. disc, 49.7 r.p.m. (per cent.).	No. 2 Test 50-in. disc, 59.7 r.p.m. (per cent.).	No. 3 Test 50-in. disc, 69.7 r.p.m. (per cent.).	No. 4 Test 56-in. disc, 69.7 r.p.m. (per cent.).
+ 6-in.	13.2	13.5	5.0	11.9	11.8
6-in. to 4-in.	2.0	3.2	2.9	5.4	3.6
4-in. to 2½-in.	2.1 } 27.6	3.2 } 29.3	3.2 } 23.8	2.0 } 25.6	3.9 } 26.1
2½-in. to 1¼-in.	10.3	9.4	12.7	6.3	6.8
1¼-in. to 1-in.	11.6	15.5	18.5	10.3	10.6
1-in. to ½-in.	20.4	23.8	27.4	24.0	24.2
½-in. to ⅛-in.	14.9	14.1	13.9	16.5	16.0
⅛-in. to 30 BSS	18.6	13.3	13.3	17.7	18.3
30 BSS to 0	6.9	4.0	3.1	5.9	4.8

The tests were carried out by members of the Area scientific staff, 60 bags from spot samples taken from the main-gate conveyor belt in the course of a producing shift constituting a test. The results are shown in Table 5.

In the conventional shearer, head coal is taken down; this is not practised in the 125-h.p. shearer loading section. The machine is now being run at 59.7 r.p.m. which gives the minimum product below ½ in.

At the beginning of operations with the 125-h.p. shearer loader dust created by the relatively high speed of the machine was expected to be a difficulty. The Area dust combat team were called on for a survey.

Water is supplied to the shearer loader from

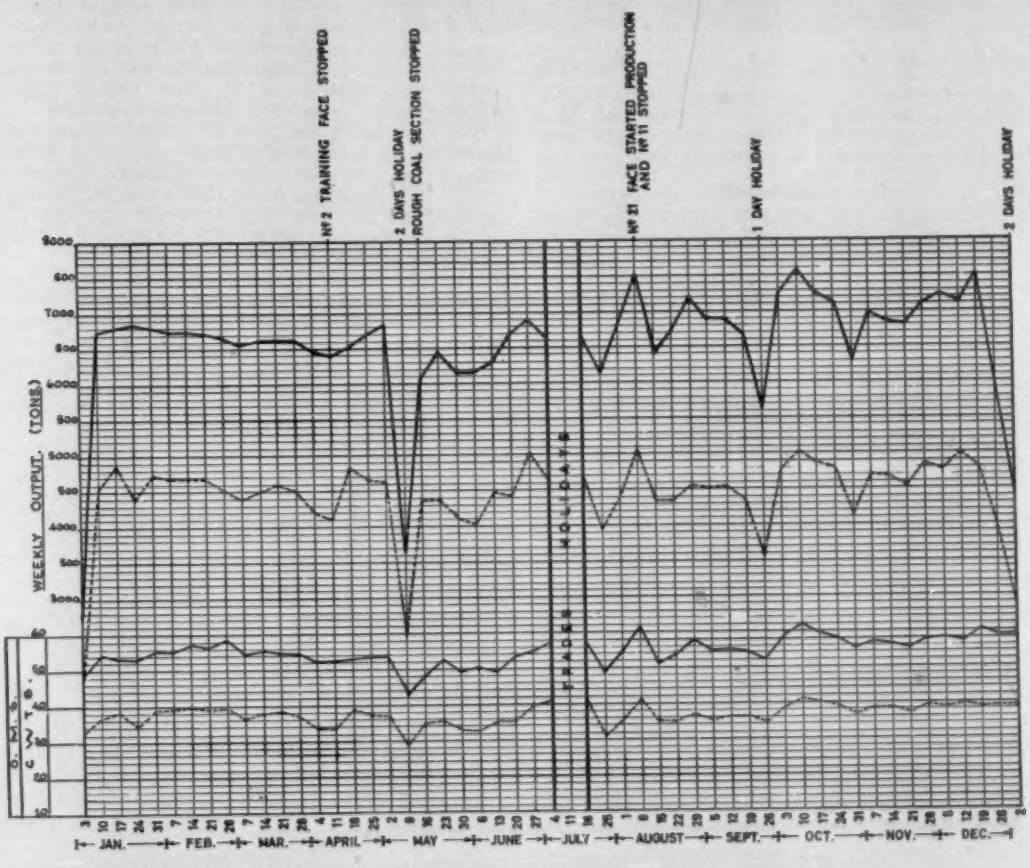

FIG. 8.—OUTPUT AND PRODUCTIVITY AT WHITEHILL COLLIERY DURING 1958.

a ¼-in. valve on the end of the supply column to act as the coolant for the 125-h.p. motor, which, after circulating round the motor water jacket, passes to the spray unit on the drum side of the machine. This spray unit consisted originally of four single spray jets, which appeared to be quite effective. However, it was decided to supplement this unit by adding a further three jets of the multi-spray type. The results shown in Table 6 were obtained with this arrangement which seems to point to the fact that the peripheral speed has a direct bearing on the dust concentration during the cutting run.

TABLE 6.—*Dust Survey Results.*

Disc diameter, in.	R.p.m. of disc.	Peripheral speed, ft./min.	Total mean concentration while cutting particles/c.c.	Faceline air velocity, ft./min.
50	49.7	652	377	44
50	59.7	782	491	44
50	59.7	782	620	70
50	69.7	912	710	70
56	69.7	1,022	1,221	80
56	59.7	876	930	80
50	59.7	782	637	80

It can be seen that a disc diameter of 50 in. and a speed of 59.7 r.p.m. gives a reasonable mean concentration, which has been borne out by a recent survey giving 383 particles/c.c. total mean concentration over a full shift.

Conclusions

The introduction of the 125-h.p. shearer loader at Whitehill Colliery has been most fortunate from the point of view of the colliery. At the time of its introduction another face encountered a very poor quality coal which eliminated a large development area. To overcome this setback, a programme of narrow drivages to develop a new area was instituted with the manpower from this abandoned section. However, with the new shearer loader building up to four cuts per shift, it was possible to maintain output from two faces instead of three, the overall result from the colliery showing little or no change.

The output graph for the year 1959 is shown in Fig. 8.

From the experience gained at Whitehill it is evident that the maximum potential of this machine has not yet been reached as the machine operating time is approximately only 66 per cent. of the working time at the face. To increase the efficiency of power-loading machines the maximum machine operating time must be achieved. This may be attained by having facelines of the optimum length, taking cognisance of the characteristics of the face conveyor, though this may mean a reduction in the number of cuts per shift. The use of self-advancing supports would further reduce the turn-round time with a substantial reduction in manpower.

An American visitor to the installation at Whitehill is installing such a support system on a retreating face with a similar shearer loader at one of his collieries and is satisfied that he will obtain an output per manshift of 50 tons. This is quite feasible, given the proper operating conditions.

At Whitehill Colliery, with a face manpower increased by only one over that required for other shearer loader faces (rippers excepted), the face output has increased from 320 to 640 tons for a shift 5½ hr. working time. The 125-h.p. shearer loader has thus been effective in increasing the bulk output from this face.

The size of the product shows an overall improvement compared with other shearer loaders at work in the same seam, although in the few tests taken this may seem inconclusive. There is no doubt in the mind of all who have visited the installation that an improvement has been obtained.

FIG. 9.—SHEARER LOADER DURING THE CUTTING OPERATION.

Cutting speeds of 30 ft./min. have been achieved during actual production on this faceline. The shearer loader (Fig. 9) and triple-strand chain face conveyor have given no trouble since their installation and, as mentioned previously, no fall in the target number of four cuts per shift can be attributed to either piece of equipment.

The success of the total caving on props only, due to the high prop density of the system, has contributed largely to the good results achieved (Fig. 10). In addition, apart from the one fall, prop losses have been negligible.

Other changes in the system

of working that have helped in this section are:—

(1) All rams are attached to the conveyor, so that points of pressure applied to the conveyor when ramming over are at regular intervals, thus cutting the time for this operation as compared with other faces in the colliery.

(2) The use of spring-loaded ram stells in ramming over the conveyor saves time.

(3) The use of the GHH bars which have only one prop setting position per bar and the strict enforcing of the rule by the officials concerned that props were only set to the bar at these positions is helping to maintain a straight faceline.

FIG. 10.—TOTAL CAVING ON A SHEARER FACE AT WHITEHILL COLLIERY.

Acknowledgments

The author wishes to thank Mr. G. R. Buchanan, Area general manager, Lothians Area, Scottish Divisional Coal Board, for permission to read this paper.

Appreciation is also recorded of the enthusiasm and goodwill of the workmen and junior officials concerned in the experimental and production periods. Thanks are also due for the help and guidance given by the directors, staff, and demonstrators of British Jeffrey-Diamond, Limited, and also to Huwood, Limited.

The views expressed are those of the author's and are not necessarily those of the National Coal Board.

DISCUSSION

Replying to MR. R. MORTON, the AUTHOR said there was no special training course for any of the electricians or engineers at Whitehill before the machine went underground and no special instruction had yet been given, although special courses had been considered.

MR. W. DUNCAN commented that the machine was high-powered and asked if the author thought the ultimate power had been reached. Mr. Duncan also asked for details of pick costs.

In reply, the AUTHOR said one of the factors in the use of a large powered machine was the question of water-cooling. That in itself could cause a lot of trouble in other collieries, although not at Whitehill. The other important thing associated with this high power was the trailing cable. It was 2.045 in. dia., 200 yd. long, and weighed 1 ton. He thought that the maximum supply of 600V made any further increases in horsepower unlikely. Picks cost 10s. 6d. each and an average of 20 picks per week, or one per slice, were being replaced.

MR. A. W. K. STEWART, who asked if any deterioration in face environmental conditions had been noted in the use of water previously used for cooling the 125-h.p. motor, was told that the water was tepid after cooling the machine, but no trouble from humidity had been experienced.

MR. P. G. TREGELLES asked if, in setting out a new face, a 2-ft. 6-in. cut would be considered. Replying, the AUTHOR said one of the things that caused trouble initially was the high loading rate. He felt that if such a machine was being installed it was best worked in conjunction with a 36-in. belt. At the moment two men were cleaning spillage from the conveyor. In order to increase productivity the author would prefer to increase the length of the face rather than the depth of cut.

A MEMBER who asked if there was a case for automatic sequence control on the conveyor and if any breakdown of the machine had occurred, was told that there might be something to be said for sequence control at transfer points, but too often they were unreliable. They had a breakdown on the machine, when two slices were lost, after the paper was written.

MR. POSTLETHWAITE said that it should be understood this was a prototype machine. Another similar machine was to be installed soon with a depth of cut of 2 ft. 3 in. Another thing to remember was that it was installed in a standby face, where there was a 30-in. conveyor belt system already installed.

MR. L. PATTERSON was interested to know if the author had any difficulty in the dip district with regard to rope breakage. In reply, the AUTHOR said when the dip area was reached at Whitehill Colliery the speed of the machine was cut down to go through it. Only one broken rope was experienced, and that was when carrying out special potentiometer tests. Normally, no broken ropes with the machine had occurred.

DR. PATERSON remarked that the face productivity was about the highest in the country for this type of machine. It reflected credit on the Lothians Area for accepting the prototype machine and for the way in which it had been applied. In handling this heavy electric cable, had consideration been given to the use of a cable reel?

Replying, the AUTHOR said the cable was being man-

handled. It was taken half way down the face and so only half of it had to be moved at any one time. Work was going on to design a cable reel to work in conjunction with the conveyor.

MR. H. H. WILSON said that with a deeper cut an exemption would be required from the Inspectorate, which would say by taking a 20-in. cut the same output would be obtained, and therefore an extension was not needed. The men were positioned along the face in teams of two and they had a stint each. A table had been given showing the cutting and flitting speeds and it appeared that the ploughing operation was much quicker than the cutting operation and so the men at the bottom end had to do their task much quicker. In view of this he asked if delays had been experienced, or had the task of the men at the bottom of the face been reduced?

The men in the bottom stints had to wait until the machine was in the stable before they could move the conveyor, said the AUTHOR. A delay, which never exceeded 15 min. was experienced, during which the machine was standing idle. That was where automatic roof supports might be useful.

In reply to MR. A. R. FARQUHAR, the AUTHOR said the drum speed of 59.7 r.p.m. gave the smallest percentage of fines.

Mechanization of Mines in India

EARLY next year—the precise dates have yet to be fixed—a symposium on "Mechanization of Mines in India," sponsored by the Central Mining Research Station, Dhanbad, the Indian Sub-branch of the Association of Mining Electrical and Mechanical Engineers, and the Journal of Mines, Metals and Fuels, is to be held at the Central Mining Research Station.

The subjects proposed for discussion fall broadly under the following headings:— Winning, methods of work, and detailed operations; conveying and transport of coal and minerals; ventilation, blasting, and allied subjects; supports, roof control, stowing, roof bolting, etc.; safety and health.

Papers are invited, with special reference to the subjects from the above fields and new plant and machinery—underground or open-cast. Papers dealing with foreign practice may be submitted provided the applicability to Indian conditions is indicated.

Anyone interested in submitting a paper should indicate, not later than August 16, his proposed subject and give an outline of the field to be covered. The paper, together with a summary of it for consideration by the symposium committee, should reach the secretary, Mr. H. Ghosal, Journal of Mines, Metals and Fuels, 6/2, Madan Street, Calcutta 13, India, by November 10.

OFFICIAL FIGURES show that Poland imported 6,900,000 m. tons of iron ore during 1959, Sweden was again the main supplier, but supplies drawn from Asia and South America are steadily increasing.

Retarding Mine Cars on Fast Gradients

SIMPLE means of retarding mine cars in track circuits where the gradients make it necessary to introduce some method of reducing the speed of cars in the circuit has been devised by Mr. R. Dalrymple, Area civil engineer in the Alloa Area of the Scottish Divisional Coal Board. His idea is to replace sections of the ordinary track surface with a resilient running surface, reasonably durable but sufficiently elastic to be compressed locally by the wheels of the car as it passes over them. This compression of the running surface offers a resistance to the passage of the car, and reduces its speed.

The length of resilient surface installed in the circuit depends on the speed reduction to be effected. To give the best results the retarding medium consists of an upper layer of material selected for its wearing qualities and resistance to abrasion, and a lower layer, fused or moulded to this, of more resilient material. Tests are still in progress to determine the most suitable materials for the purpose.

The retarding surfaces can be provided in two forms, either bolted on to the surface of a length of smaller section than the rails used in the remainder of the circuit, or as a block of material, fitted to a timber sole contained in the web of a rolled-steel channel which replaces the conventional rail section. In either case the top surface of the retarding material is sufficiently proud of the surface of the adjoining rails to compensate for the compressibility of the resilient material and thus give a smooth transition of the car to the retarding section.

In order to compensate for wear, provision is made for packing pieces to be inserted under the rail or rolled-steel channel to maintain the running surfaces at the correct level relative to the tops of the adjoining rails.

SOLID FUEL: NCB States Case to Local Councils

THAT solid-fuel heating is cheapest to install and cheapest to operate is the theme of a booklet which the National Coal Board is circulating to members of local councils throughout the country as part of its campaign to combat competition from fuel oil. The booklet points out that it is fashionable at the moment to praise new fuels at the expense of coal, but asks local authorities to decide future heating plans on hard facts rather than the fashion of the moment.

"Burned on modern appliances, coal and the solid fuels obtained from it are just as clean, convenient, and smokeless as liquid fuels . . . and they are cheaper, too," it claims. The booklet gives details of the most suitable solid-fuel appliances for use in schools, baths, hospitals, and other public buildings; houses, flats, park greenhouses; and industrial buildings such as laundries, abattoirs, and bus depots and workshops. It also explains the free technical service which the board has set up to advise present and potential users of solid fuel.

Large Casting in Record Time

THE FIRST 180-TON MILL HOUSING BEING FETTLED IN THE GRIMESTHORPE STEELFOUNDRY.

FIRST of two 180-ton housings for the new aluminium rolling mill to be installed next year in the Kitts Green Works, Birmingham, of James Booth Aluminium, Limited, has been cast in record time by English Steel Castings Corporation, Limited, at its Grimesthorpe steelfoundry, Sheffield—the only steelfoundry in Great Britain capable of producing castings of this size.

The new 148-in. four-high hot aluminium mill—the largest of its type in western Europe—was ordered by James Booth from the Loewy Engineering Company, Limited, Bournemouth, in February and the order for the casting of the two housings was placed with English Steel in March. The first housing was cast in May, only eight weeks after the order was placed.

A similar record was set up by the pattern-makers, G. Perry & Sons, Limited, Aylestone (Leics). The pattern—the largest the company has ever produced—was made in six weeks. The pattern used 10½ tons of timber.

CASTING THE FIRST OF THE TWO 180-TON MILL HOUSINGS AT GRIMESTHORPE.

The total weight of steel used in the casting—one of the largest mill houses ever produced in this country—was 250 tons. Three large Siemens open-hearth furnaces were used to supply the 213 tons of molten steel required for the initial pouring, and a further 37 tons was added through the two feeder heads at intervals of 2, 4, 6, and 11 hr.

A feature of the operation was the co-ordination of the melting programmes of the furnaces, each of which had to be ready for tapping exactly on schedule. After cooling for approximately four weeks, the casting was fettled and the two feeder heads, which weighed 35 tons each, were cut off. The finished casting, which weighs 180 tons, measures 35 ft. 9 in. high, 15 ft.

wide, and up to 8 ft. 7 in. thick. Special lifting tackle had to be designed to facilitate manipulation of the housing at various stages of production.

The housing is being transported in August to the English Electric Company, Limited, Netherton, Liverpool, for machining before being delivered and installed at James Booth Aluminium. The second housing is scheduled for casting shortly.

A £500,000 contract for the electrical equipment for the new 148-in. mill and for a new 72-in. four-high cold strip mill has been awarded by James Booth Aluminium to the English Electric Company. The electrical contract includes main motors for the four-high mills and edging mill, as well as a large number of ancillary motors, converting equipment, control gear, and switchgear, which will be manufactured at the English Electric works at Stafford, Kidsgrove (Staffs), Liverpool, and Bradford, and such auxiliaries as lubricating and ventilating equipment, and will be engineered by the company's metal industries division, Stafford.

Industrial Training in Operational Research

INTRODUCTION of a graduate apprenticeship scheme for specialized training in operational research is announced by the British Iron and Steel Research Association. The purpose of the scheme is to train recruits, not only in the specialist techniques but also in the practical art of applying these methods to actual industrial problems.

During the two-year course the apprentice will be regarded as a temporary member of BISRA staff at a salary of £700 per annum at the age of 21, with an extra £25 per annum for each year above that level. Training will consist of day-to-day experience as a member of a team engaged on actual problems in the steel industry followed by a more formal course in techniques, arranged in collaboration with the London School of Economics. The course will culminate in an examination for the diploma in operational research recently instituted by the LSE. The basic qualification for an apprentice is a good degree in a pure or applied science, mathematics, or statistics.

BISRA's operational research department, which is sponsoring the scheme, was started in 1946, and has a wide industrial experience of operational research. The new scheme provides an unusual opportunity for the ambitious man to acquire a first-class training in a rapidly expanding field. Further particulars can be obtained on application to BISRA's personnel officer, at 11, Park Lane, London, W.1.

Swedish Ore Deposits

Workable deposits of iron ore in the central Swedish mining districts are likely to total at least 650,000,000 tons according to recent estimates, said Mr. Rutger Wijkander at a recent technical meeting of the Swedish Ironmasters' Association. This is considerably more than earlier believed; an assessment made in 1950 put the deposits at 400,000,000 tons. The ore finds correspond to a volume of 225,000,000 tons of iron ore, as against 150,000,000 tons under the 1950 assessment.

Iron-ore Production in Socialist World

AT the recent seventh session of the section of the Economic Mutual Assistance Council responsible for raw materials for the metallurgical industry, held at Krivoi Rog in the Ukraine, discussion was devoted in the main to the merits of various methods of preparing iron ores for the blast furnace and the adoption of the best of these, as appropriate, at various centres of iron and steel production in the countries of the Socialist block.

Speaking for the USSR, Mr. Nikolai Titkov said that 50 per cent. of all iron ore produced in the Soviet Union was being dressed; this percentage would be increased in the next few years. Soviet specialists, he said, had evolved effective methods for the dressing of lean ores which had not been used for furnace production in the past. These were being applied in two large ore-dressing plants which had been built in the Krivoi Rog ore basin, the largest of its kind in the USSR, where reserves of lean magnetite ores ran into 10,000,000,000 m. tons.

Using ores of from 30 to 37 per cent. iron content, these two plants were producing some 10,000,000 m. tons of concentrate containing over 60 per cent. of iron annually. Tests were being conducted there, he added, on an industrial scale of the enrichment by flotation of lean oxidized iron ores, of which there are about 50,000,000,000 m. tons in the area.

By 1965, four more large ore-dressing plants, the largest of which would be capable of processing up to 24,000,000 m. tons annually, would be put into service in the Krivoi Rog basin, and further plants, also of the type described, with an annual capacity of 36,000,000 m. tons would be put into service in other parts of the USSR.

Mr. Titkov claimed that no other country in the world had plants such as these at the present time, and recommended them for adoption by his colleagues, wherever the conditions were suitable for their use.

Reports were made on the fulfilment of recommendations adopted at previous sessions of mining and ore-dressing groups, and plans were drafted for further improving the quality of metallurgical raw materials in all the countries represented—the Socialists countries associated together under the Warsaw Pact, the German Democratic Republic, and the People's Republic of China. Some time was devoted, in conclusion, to the discussion of the standardization of methods of estimating reserves, etc.

ECSC IRON-ORE PRODUCTION in May totalled 8,061,000 metric tons, compared with 8,050,000 tons in April and 6,807,000 tons in May, 1959. In the first five months of this year iron-ore output totalled 40,755,000 tons, compared with 36,215,000 tons in the same period of 1959.

New Equipment and Products

High-speed Vibratory Screens

DEVELOPMENTS in high-speed vibratory screens design are announced by W. J. Jenkins & Company, Limited, Retford (Notts), which is now manufacturing its Viking screens with a completely new driving unit. The drive and vibrator are incorporated in the driving motor and in the new screens to be known as the Viking-Grantham (Fig. 1), rendering obsolete the conventional out-of-balance shaft with heavy bearing and V-rope drive.

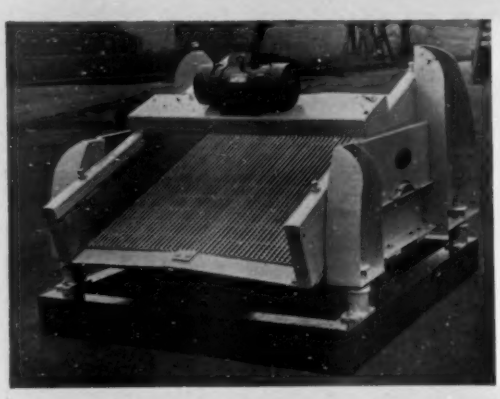

FIG. 1.—VIKING-GRANTHAM SCREEN WITH DRIVE AND VIBRATOR INCORPORATED IN THE DRIVING MOTOR.

In addition to simplifying the design, there is considerable saving in horsepower required and a wide range of adjustments to the amplitude of vibration is easily obtained by a simple operation. These advantages, together with the adjustable angle of deck from 5 deg. to 30 deg., are claimed to make these screens ideal for a wide range of materials and duty.

Single- and double-deck models are at present available in two sizes—the Viking-Grantham Minor with a tray 4 ft. long by 2 ft. 7 in. wide and the Viking-Grantham Major with a 5 ft. long tray 3 ft. 7 in. wide.

Ferodo Industrial Disc Brake

WHILE substantial testing and development work has been devoted to the motor vehicle disc brake, much less time and effort have been spent on disc brakes for industry. Recently, however, Ferodo Limited, Chapel-en-le-Frith, Stockport, in conjunction with De Bergue Machine Tools, Limited, West Gorton, Manchester, has completed a development project to enable a unique range of disc brakes with capacities from ¼ to 65 h.p. to be established. Known as the "Discgrip" series, they are claimed to be revolutionary in the mechanical handling industry and are quite free from brake fade. De Bergue Machine Tools has taken out a provisional patent No. 31569/59 for the "Discgrip" design, which it will introduce for general industrial purposes towards the end of this year.

It is of the solenoid-operated "fail to safety" type and is intended primarily for use on cranes and lifting gear. The "Discgrip" brake has been specifically designed around Ferodo DS5 disc brake friction material. For the Ferodo test schedule a 12½-h.p. twin caliper prototype brake with four friction pads was used, the tests reproducing the conditions obtaining on a 5-ton overhead travelling crane operating under constant full load, where the brake spinner disc speed was normal at 700 r.p.m. and under full load with up to 100 per cent. overspeed conditions. Throughout the tests a record was kept of braking torque, stopping times, temperature rise, and rate of wear of the friction pads. To comply with the BSS conditions for hoisting mechanisms, the brake had to be capable of stopping a 5-ton load 240 times per hour, and of arresting its motion when lowering within a vertical distance of 6 in. To do this it was calculated that the braking torque required was 94 lb.-ft.

The results show that the torque output from the brake was always 220 per cent. greater than the required value. Moreover, the load stopping distance was always less than 5 in., and this efficiency in the brake was maintained even under 100 per cent. overrun conditions.

Numec "Cadet" Portable Conveyor

A NEW portable belt conveyor (Fig. 2) now being produced by Numec, Limited, New Whittington, Chesterfield, is known as the "Cadet." Its overall length is 22 ft. It can be operated at any angle up to 45 deg. and will load up to a height of 17 ft. with one end on the ground. The central height can be varied from 3 ft. 3 in. to 8 ft. 6 in.

The conveyor has a pair of large-diameter wheels fitted with pneumatic tyres so that it can be moved easily by one man. There is a towing bracket at the hopper end and both the bracket and hopper are detachable. The hopper is generally used for loading

FIG. 2.—THE "CADET" PORTABLE CONVEYOR.

loose materials and its capacity can be increased by the addition of detachable extension pieces. Either a petrol or electric motor can be supplied for external drive or else an electric motorized drum can be fitted.

The belt has 2-in. corrugated sides and tough cross bars, enabling it to handle any granular material including sand, coal, and coke. Sacks and bales, or cases even larger than belt width can also be transported. Depending upon the type of material and the operating angle, the "Cadet" has a capacity of up to 75 ton/hr. Both the raised sides and the cross bars permit a greater working angle than with normal belting.

The belt is made for Numec, Limited, by the Dunlop Rubber Company, Limited, in standard widths from 9 in. to 36 in. and with corrugated sides 2 in. and 3 in. high. These raised sides form tough walls on the straight without tension at the ends. The height of the sides increases the bulk carrying capacity by up to 50 per cent. over conventional belting of equal width.

New Fire Pump Set

INTRODUCTION of a new independent fire pump set for marine and general fire-fighting duties (Fig. 3) is announced by Goodyear Pumps, Limited, 44, Brook Street, London, W.1, a member of the Holman group, Camborne (Cornwall). The new fire pump which is approved by the Ministry of Transport and complies with "Safety of Life at Sea" Regulations, combines a Goodyear A.12 positive displacement rubber-to-metal pump and a Petter AVA.2 air-cooled diesel engine (10 b.h.p.) to form a reliable, compact, efficient, and portable set, direct coupled at the 1,800-r.p.m. engine main shaft speed.

The Goodyear pump has an output of approximately 5,000 gal./hr. when operating at this engine speed. It can deliver easily two jets of water of over 60 ft. through ¼-in. nozzles and two 40-ft. jets through ⅜-in. nozzles. For all duties the pump can operate with heads up to 150 ft. and with suction lifts of 27 ft.

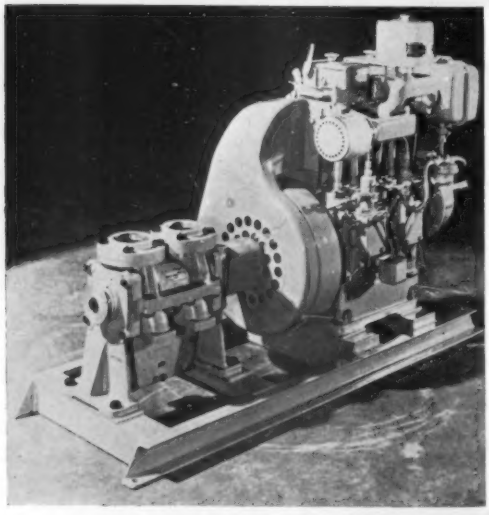

FIG. 3.—GOODYEAR FIRE PUMP SET FOR MARINE AND GENERAL FIREFIGHTING DUTIES.

The fact that the pump is self-priming is an important consideration, and the high suction lift enables it to be installed in positions where this is unavoidable.

The pump and diesel engine are mounted on a fabricated channel steel bed plate and the pump is driven through a centrifugal clutch coupling. The complete unit is 52 in. long, 19 in. wide, and 38 in. high, and its weight, complete with by-pass relief valve, is approximately 750 lb.

The "Quadriflex" Flexible Coupling

RECENTLY introduced by R. & J. Dick, Limited, Greenhead Works, Glasgow, S.E., is a flexible coupling claimed to withstand all types of misalignment and end float. The coupling, which is called "Quadriflex," has a torsional flexibility of 15 deg. at peak torque compared with 1 deg. to 3 deg. for other types, and the ability to absorb vibration and shock.

The coupling is simple in design, consisting of two flanges and a two-piece flexible rubber sleeve. The teeth of the sleeve halves lock into the teeth of the flanges without clamps or screws and tighten under torque to provide smooth transmission of power. There is no metal-to-metal contact and the absence of wear eliminates the need for lubrication or maintenance.

As the name implies, the "Quadriflex" coupling is designed to provide all the four degrees of flexibility:— Angular misalignment up to 1 deg; parallel misalignment up to $\frac{1}{16}$ in., depending upon shaft size; free end float up to ¼ in., depending upon coupling size; and torsional load.

The couplings are designed to provide maximum operating safety. External finish is smooth and there are no protruding nuts or bolts to cause injury. The rubber sleeve acts as an electrical insulator between the driver and the driven unit.

Non-destructive Testing of Steel

FOR non-destructive testing of steel thicknesses of up to 4 in., the majority of existing supervoltage X-ray units and radioactive isotopes are suitable. Above that thickness, however, exposure times become too long. At the same time, as thicker fabrications in steel become more common and as radiography is extended to the testing of other types of material such as reinforced concrete, the need arises for a powerful X-ray generator possessing an extremely high degree of sensitivity.

The Siemens 15-MeV mobile betatron (Fig. 4), recently introduced by Pantak, Limited, Vale Road, Windsor (Berks), comprises essentially an electromagnet shaped in the form of a shell-type transformer which contains an air gap in its middle leg. The function of this a.c. excited transformer is to create a magnetic flux in which electrons are accelerated almost to the speed of light in a doughnut shaped accelerator tube surrounding the electromagnet. The flux produced varies rapidly in shape from the injection stage, when electrons are injected from a cathode filament, through four following stages of deflection and transfer into the magnetic field, a packing phase, a distribution phase, a phase when the flux is constricted, this leading finally to the emission of electrons which strike a platinum target and thus give rise to extremely high energy X-rays. During this process the electrons travel approximately 1,000 miles.

The substantial savings in exposure time which can be made with this new tool are shown, for example, by the fact that exposures for steel thickness of between 6 and 8 in. are only a few minutes, while that for a 16-in. thickness of steel is between one and two hours, as compared with an exposure of several days which would be required even with a supervoltage X-ray tube

of the conventional type. Apart from this saving, a new technique of radiographing a workpiece while still hot is possible, and since the cooling-for-examination stage is one where flaws may develop, the elimination of this stage in fabrication of thick sections can lead to the prevention of costly flaws in this type of work as further fabrication can follow inspection without the need for a fluctuating temperature gradient. A further point of note is the fact that a magnification technique, giving an image of up to three times the size of the flaw, can be used with this betatron.

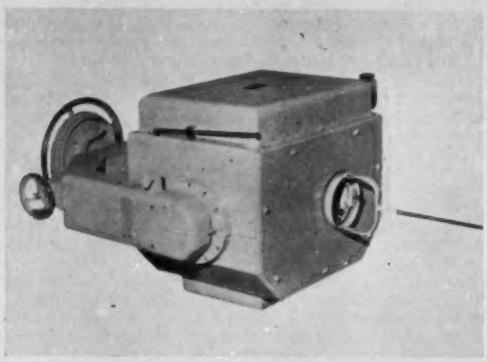

FIG. 4.—SIEMENS 15-MeV MOBILE BETATRON.

New Loader Available

A NEW tracto-loader manufactured by Allis-Chalmers is now available in this country through Mackay Industrial Equipment, Limited, Faggs Road, Feltham (Middx).

Some of the features of the new machine, the TL. 16 D (Fig. 5), are four-wheel drive and a complete power shift transmission with a 3.5 to 1 single stage hydraulic torque converter drive which multiplies engine torque up to 350 per cent. Large planetary axles provide more rim pull with less strain on the axles, transmission, universal joints, and differential. The axles are pin-connected directly to the frame with 2-in. dia. steel pins, instead of by the usual U-bolt connection. The rear steering axle has an oscillation of 20 deg. for negotiating rough terrain. An Allis-Chalmers 104-h.p. 4-cylinder diesel engine provides the power.

The TL.16D has three speeds in both forward and reverse with a top speed of 27 m.p.h. Effortless shifting into any speed is made possible by the Allison power shift transmission and hydraulic clutches.

Power steering and four-wheel power brakes are provided, which can be operated with the right or left foot. It also has a separate positive parking brake fitted to the transmission output shaft. A range of buckets for the TL.16D is provided with capacities from 1½ cu. yd. to 4 cu. yd., all of which are based on a 7,000-lb. carrying capacity and a lifting capacity of 17,000 lb.

The bucket has a 40 deg. tip-back angle at ground level and a 45 deg. tip-back at the carry position, ensuring that full bucket loads are maintained while travelling.

Dumping height of the new loader is 9 ft. from the cutting edge of a 2-cu. yd. standard bucket tipped at 45 deg. with a 3-ft. ½-in. reach. Through the use of the straight-line linkage of the main booms with the lift and dump cylinders, maximum power is transmitted to the bucket. Both cylinders with chromium plated rods are mounted well away from the bucket; damage from dirt and rocks, therefore, is virtually impossible.

Other features of the TL.16D include Hi-Traction differential, which transfers power to the wheels that have the greatest adhesion; automatic clutch cut-off gives full engine power to the hydraulic system at the touch of the brakes; a one-piece welded frame and a fully adjustable operator's seat.

FIG. 5.—ALLIS-CHALMERS TL.16D TRACTO-LOADER.

Bauxite Store for Hungary

Construction of a store to hold up to 300,000 tons of bauxite on an area of nearly 10 acres has begun at Halimba, a small railway town in north-west Hungary which receives most of the ore from the Bakony region bauxite mines. A modern mixing plant is to be built nearby to ensure delivery of uniform quality bauxite to the country's alumina factories. Total cost will be £2,250,000.

Open-cast Iron Mine in the USSR

The Mikailovski open-cast iron-ore mine, the fourth of its kind in the vicinity of the famous Kursk magnetic anomaly, with an annual capacity of 4,500,000 m. tons, has been put into service. The reserve of rich iron ore, containing slightly under 66 per cent. of iron, and therefore not needing preliminary beneficiation, in this area is estimated at over 500,000,000 m. tons, in addition to which there are lean ores—ferrous quartzite —amounting to at least 10,000,000,000 m. tons.

Coseley Buildings Boosts Exports

VISIT of Lord John Hope, Minister of Works, to Coseley Buildings, Limited, at Lanesfield, Wolverhampton, on Tuesday of last week was the first visit by a Minister into industry's heart under a new and urgent Government approach to industry to boost the country's exports. As such it was a well-chosen example of what can be done in the field of oversea trade.

Founded only 11 years ago, Coseley Buildings has built up an impressive export business in small and large buildings applicable to a multitude of purposes.

The company has clearly something new to offer; its success is founded upon the idea of producing steel-framed buildings of a standard design so that they could be manufactured by mass-production methods. Apart from economy, the design which resulted from this original conception had other advantages—the buildings could be erected speedily and by unskilled labour.

The original range is now greatly extended, and to it have been added such variations as light-frame buildings for climates where there is no snow loading, crane bay buildings, and saw-tooth roof buildings. In addition, there is the new aluminium Coseley house, which sets new high levels in quality and appearance for buildings of this type.

Today, an order can be placed for a building or a group of buildings—a factory or military camp, a generating station or a church, a canteen or a theatre—and it will arrive as a packaged article complete with every nut and bolt, with glass for the windows, and with heating pipes and wiring cut to the correct lengths—even with the necessary supply of paint.

The Minister's visit coincided with the receipt by the company of two large orders one from Northern Ireland and the other from Iraq, the latter being valued at £80,000 and followed the recent execution of a £50,000 order by the company. Lord John Hope, who announced details of the two orders, said that his visit was being made for two reasons. He wanted to see the production process of the Coseley group and also to encourage all manufacturers in the Wolverhampton area to expand their exports.

The Minister emphasized that the Board of Trade, through its regional organization, was able—and very willing—to help any producer to find suitable oversea markets.

OPENING ADDRESS at the 1960 national conference of the British Institute of Management at Harrogate on October 11 will be given by Sir John Hunt, the well-known mountaineer. Prof. Northcote Parkinson, author of "Parkinson's Law" and his recent book "Law and the Profits," will speak at the closing dinner on October 13.

US Iron and Steel Statistics

EIGHTY-EIGHTH annual statistical report in the series prepared by American Iron and Steel Institute and its predecessor, the American Iron and Steel Association, and the 48th since the series was begun by the institute, has now been issued for 1959.

Included in this publication, for the first time, is an interesting series of annual financial data for the steel industry beginning with the year 1935. The series represents an aggregate of financial statistics of companies primarily engaged in the production of iron and steel. The industry capacities of pig-iron and steel ingots are compiled regularly by the institute and this financial series includes companies with approximately 95 per cent. of the total respective capacities. It is pointed out that the percentages cannot be increased to 100 because nearly 4 per cent. of ingot capacity is operated by companies primarily engaged in the production of automobiles, farm machinery, and other metal products.

An additional feature of the financial series is that some indication is given of the portion of total employment pay rolls of the aggregate of the concerns attributed to iron and steel production. It should not, however, be assumed that the same ratios can be applied to sales, costs, or profits, but they do tend to indicate the amount of non-steel activity which has been included in the overall financial statistics.

The report is published by the American Iron and Steel Institute, 150, East Forty-Second Street, New York 17, N.Y. (price $5).

Steel Development in Argentina

COMMITMENT to invest $(US)3,660,000 in Acindar Industria Argentina de Aceros, S.A., of Santa Fé Province, Argentina, to help finance a programme for modernization of facilities and increased production of a wide range of rolled-steel products, wire and wire products, and galvanized and black pipe, is announced by the International Finance Corporation. The Acindar company was incorporated in 1942 and has expanded operations several times; it now has plants in the cities of Rosario and Villa Constitucion. Its production accounts for about 45 per cent. of the total output of Argentina's primary steel-producing and converting companies. The Villa Contitucion rolling mill is the largest in the country.

The IFC investment will help finance modernization of the pipe mill and expansion of capacity from 56,000 to 120,000 tons per year. The new expansion programme also includes the following:—Modernization of the wire mill and expansion of capacity from 71,000 to 100,000 ton/yr.; modernization of the rolling mill and expansion of capacity from 228,000 to 382,000 ton/yr.; expansion of generating capacity from 5,000 to 17,500 kW.

TARGET for gross industrial output under the Russian national economic plan was exceeded by 4 per cent. in the first six months of the year, the USSR Central Statistics Board has announced. Production of steel, ferrous rolled stock, iron ore, non-ferrous metals, many engineering products, electric power, and coal has been fulfilled ahead of time.

ROTARY REACTOR REDUCES SULPHUR AND SILICON

Pilot Plant Results

In recent years, desulphurization and desiliconization external to ironmaking and steelmaking furnaces has been the subject of considerable research, particularly in Europe, where the sulphur problem has been greater than in the United States. Even in the US sulphur shows signs of becoming more important with the increased use of imported ores, and it is already a problem in foundries. Desiliconization, on the other hand, has been explored with some interest during the past few years as a means of decreasing the tap-to-tap time of the open-hearth process.

IN the United States, the Diamond Alkali Company, already involved in desulphurization through the sales of reagents, set about working out a more effective desulphurization process. The result was the design of the high-speed rotary reactor by Norman Goss, a consultant for the firm.

The reactor, described in the Journal of Metals (March, 1960), has three main sections:—(1) Base, serving as the foundation, complete with variable speed drive and drive rollers. (2) Refractory-lined rotor, supported by rolls with a dam at the inlet end and open at the discharge end to facilitate metal removal. (3) Refractory-lined hood that can be rolled forward so that it encompasses the open end of the rotor to receive the discharged metal.

At the base of the hood is a discharge runner for hot metal, while an exhaust duct is arranged for fume control. In order to preheat the reactor, one gas burner is situated in the hood; a second is on a pivoting support at the inlet end of the rotor. Treating additives, stored in a hopper situated above the inlet end of the machine, are introduced through a water-cooled tube extending into the inlet end of the rotor.

Detailed Development Programme

The effectiveness of the rotary reactor was investigated in a detailed development programme carried out by the Battelle Memorial Institute. Tests were undertaken with a 10-ton/hr. reactor having a 3-ft. long rotor with an inside diameter of 10 in. Of prime interest was the evaluation of various chemical additives and the effect of temperature, reaction time, and rotational speed. Desulphurization materials, such as calcium carbide, lime, soda ash, and caustic soda, were tried, and iron ore and oxygen were used on desiliconizing tests.

It proved possible to reduce silicon from 1.27 to 0.40 per cent. simultaneously with desulphurization. In addition, the phosphorus level was reduced by as much as 28 per cent. during this treatment.

After three years of experimental work, a 60-ton/hr. reactor was built and installed in an Ohio foundry for a test programme under production conditions. This machine has a 6-ft. long rotor with an inside diameter of 24 in. Results of this work, completed only recently, revealed that no significant problems were entailed in applying the process to full commercial operation.

Pilot Plant Operation

Treatment begins with hot metal flowing through the inlet runner into the revolving rotor. Held to the inner wall by centrifugal force, the metal forms a 1- to 2-in. thick layer covering the entire surface. Near the stream of incoming metal, the treating agent is added in solid, liquid, or gaseous form. As the material builds up a head against the dam at the inlet end of the rotor, a turbulent, helical flow takes place towards the discharge end of the rotor.

Thus, there are four conditions present which cause intimate contact between molten metal and treating agent. These are:—(1) Maintenance of a thin layer of metal, hence large surface area, during reaction; (2) turbulent action resulting from flow of metal through the rotor; (3) use of an additive of small particle size or gaseous form, and (4) centrifugal force causing the layer of treatment material to be pressed against the surface of molten metal.

With the pilot reactor, iron was repeatedly desulphurized from 0.11 per cent. to lower than 0.02 per cent., and results obtained with the 60-ton/hr. unit showed sulphur reduced from an average of 0.08 to less than 0.02 per cent. This is on the basis of a retention time of 10 to 20 sec. within the rotor. Treated metal and slag leaving the rotor are collected in the hood and flow continuously out through the discharge runner. If desired, slag separation may be attained by damming and skimming the flow in this runner.

Temperature losses are reduced to a minimum by carrying out the reaction within a closed or balanced draught system. After the 60-ton/hr. reactor had reached thermal equilibrium, a maximum temperature drop of 45 to 75 deg. F. was experienced. If operations are intermittent, preheating is required.

Fume control is attained by maintaining a balanced draught within the reactor by means of a butterfly damper in the hood exhaust duct.

Pig-iron and Steel Production

STATISTICAL SUMMARY

IN the following United Kingdom pig-iron and steel statistics, issued jointly by the Iron and Steel Board and the British Iron and Steel Federation, Table 1 gives the production of pig-iron and ferro-alloys and the number of furnaces in blast in May. Table 2 gives the production of steel ingots and castings in May and Table 3 gives details of deliveries of finished steel in April last. Activities of the industry are summarized in Table 4.

TABLE 1.—*Weekly Average Production of Pig-iron and Ferro-alloys in May, 1960. (Thousands of Tons.)*

District.	Furnaces in blast.	Hematite.	Basic.	Foundry.	Forge.	Ferro-alloys.	Total
Derbys, Leics, Notts, Northants, and Essex	21	—	31.4	21.9	0.2	—	53.5
Lancs (excl. N.-W. Coast), Denbighs, Flints, and Cheshire ..	6	—	17.1	—	—	1.9	19.0
Yorkshire (excl. N.-E. Coast and Sheffield) ..	—	—	—	—	—	—	—
Lincolnshire ..	8	—	38.7	—	—	—	38.7
N.-E. Coast ..	17	1.9	60.3	—	—	1.4	63.6
Scotland	7	—	25.8	1.5	—	—	27.3
Staffs, Shrops, Worcs, and Warwicks ..	5	—	8.1	1.0	—	—	9.1
S. Wales and Monmouthshire	11	3.2	60.9	0.7	—	—	64.8
Sheffield	2	—	3.4	—	—	—	3.4
North-West Coast	8	16.9	—	1.5	—	1.3	19.7
Total ..	85	22.0	245.7	26.6	0.2	4.6	299.1
April, 1960 ..	86	26.4	252.5	27.9	0.1	3.7	310.6
May, 1959 ..	80	19.0	198.5	17.3	1.4	4.3	240.5

TABLE 3.—*Weekly Average Deliveries of New Non-alloy and Alloy Finished Steel in April. (Thousands of Tons.)*

Product.	1958.	1959.	1960. April.	1960. March.*	1960. April.
Ingots, blooms, billets, and slabs‡ ..	4.6	5.1	6.0	5.5	5.8
Heavy rails ..	10.2	6.8	8.2	10.0	9.3
Sleepers	1.2	0.6	1.5	0.5	0.5
Fishplates and soleplates	0.7	0.4	0.5	0.6	0.7
Plates:					
(i) Over ⅜ in. thick	29.6	24.8	25.4	31.3	31.3
(ii) Under ⅜ in. ..	17.7	18.3	17.4	23.2	23.9
Other heavy prods.	41.8	41.2	40.3	56.3	56.5
Ferro-concrete bars	7.6	9.6	8.7	12.7	10.2
Wire rod	21.5	23.5	24.6	29.9	29.8
Arches, etc. ..	8.6	7.8	8.9	8.5	8.6
Other light sections	29.1	33.0	32.6	45.5	41.7
Bright steel bars ..	6.2	7.6	7.7	10.3	10.0
Hot-rolled strip ..	22.6	27.4	27.3	35.3	33.8
Cold-rolled strip ..	7.0	8.0	7.8	10.7	9.9
Sheets incl. coated:					
(i) Hot-rolled ..	10.6	11.8	10.4	13.9	13.5
(ii) Cold-reduced	31.1	35.2	38.8	43.5	40.2
Tinplate:					
(i) Hot-dipped .	8.4	7.7	7.7	9.1	9.2
(ii) Electrolytic ..	10.3	13.2	13.8	15.6	15.2
Blackplate ..	0.8	0.7	0.6	1.0	0.8
Tubes up to 16 in.	19.0	20.6	20.9	24.5	24.1
Tube fittings, etc..	0.4	0.4	0.4	0.4	0.4
Tyres, wheels, and axles	4.5	2.4	3.0	2.8	2.3
Forgings(excl. drop)	2.6	2.1	2.4	2.2	2.2
Steel castings ..	4.2	3.6	3.9	4.3	4.0
Tool steel	0.2	0.2	0.2	0.2	0.2
Total	300.5	312.0	319.0	397.8	384.1
Alloy steel	16.1	18.2	19.1	23.1	22.5
Total deliveries from UK production†	316.6	330.2	338.1	420.9	406.6
Add: Imported finished steel ..	7.0	7.1	9.7	15.1	23.2
	323.6	337.3	347.8	436.0	429.8
Deduct: Intra-industry conversion§ ..	41.2	47.6	51.5	61.2	62.0
Total new material ..	282.4	289.7	296.3	374.8	367.8

† Includes finished steels made from imported ingots and semis.
‡ Other than for conversion into any other form of steel listed.
§ Material for conversion into other products also listed in this table.

TABLE 2.—*Weekly Average Production of Steel Ingots and Castings in May, 1960. (Thousands of Tons.)*

District.	Open-hearth. Acid.	Open-hearth. Basic.	Bessemer.	Electric.	All other.	Total. Ingots.	Total. Castings.	Total ingots and castings.
Derbys, Leics, Notts, Northants, and Essex ..	—	4.8	16.8 basic	2.9	0.1	22.9	1.7	24.6
Lancs. (excl. N.-W. Coast), Denbighs, Flintsand Cheshire	0.6	40.7	—	5.7	0.3	45.8	1.5	47.3
Yorkshire (excl. N.-E. Coast and Sheffield) ..								
Lincolnshire	—	49.6	—	—	0.1	49.6	0.1	49.7
North-East Coast	0.9	87.4	—	1.6	0.5	88.4	2.0	90.4
Scotland	1.3	46.6	—	3.9	—	49.8	2.0	51.8
Staffs, Shrops, Worcs. and Warwicks ..	—	25.7	—	4.3	0.8	28.9	1.9	30.8
S. Wales and Monmouthshire ..	2.2	91.4	16.1 basic	0.7	0.1	110.1	0.4	110.5
Sheffield (incl. small tonnage in Manchester) ..	9.7	39.0	—	14.4	0.3	61.3	2.1	63.4
North-West Coast	—	—	6.0 acid	0.9	—	6.8	0.1	6.9
Total	14.7	385.2	38.9	34.4	2.2	463.6	11.8	475.4
April, 1960	11.4	394.9	37.7	32.1	2.0	467.5	10.6	478.1
May, 1959	12.2	319.3	25.7	25.5	1.9	375.3	9.3	384.6

TABLE 4.—*Iron and Steel Index and General Summary of Pig-iron and Steel Production. (Weekly Average in Thousands of Tons.)*

Period.	B.o.T. Price Index, 1938 = 100. Iron and steel.	Coal.	Basic materials§	Iron-ore output.	Imported ore used.	Coke sent to blast furnaces.	Pig-iron, ferro-alloys prod.	Scrap used in steel prod.	Steel (incl. alloy). Imports.†	Prod. ingots, castings.	Delivrs. finished steel.	Stocks.‡
1957	328	488	537	325	303	270	275	220	14	417	322	2,580
1958	343	403	478	276	262	227	245	196	9	369	284	2,242
1959	340	497	477	286	244	210	242	208	7	388	291	2,244
1960—March*	337	502	487	347	325	262	312	286	19	485	376	2,243
April ..	338	502	489	326	329	265	311	251	23	478	369	2,292
May ..	338	483	489	337	317	261	299	252	27	475	392	2,245

* Months contain five weeks, all tables. ‡ Stocks, ingots, semi-finished and finished steel, at the end of the years and months shown.
† Weekly average of calendar month. § Used in non-food manufacturing industries.

African Notes

ISCOR's NEW PLANT

Will Raise Capacity to 2,350,000 Ingot Tons

WHEN the present £56,000,000 expansion and modernization scheme of the South African Iron & Steel Industrial Corporation, Limited (ISCOR) is completed in a year or two, its newest plant at Vanderbijlpark will produce more steel than the parent concern at Pretoria. ISCOR's total production capacity will then be 2,350,000 ingot tons of steel, of which Vanderbijlpark's contribution will be 1,250,000 ingot tons. Announcement is expected shortly of a further expansion plan for a new mill in Natal to raise ingot production to 4,000,000 tons annually by 1970.

Liberia has offered to supply iron ore mined at Nimba to Japan. It has been estimated that the joint Liberian-American-Swedish Minerals Company, Limited, could supply between 500,000 and 1,000,000 tons of iron ore from Nimba annually for the first few years. The trading concern of Mitsui Bussan Kaisha is considering a plan to build iron-ore carriers for the transportation of Liberian ore direct from the ports.

Raymond International of Liberia has been awarded a $40,000,000 contract to build a new line to carry iron ore for the Liberian-American-Swedish Minerals Company. The railway is to run from Nimba, on the Guinea border, to a new harbour being built at Bassa, and will carry nearly 300,000,000 tons of ore to the port.

New Electrical Company

One of France's largest manufacturers of electrical equipment, Forges et Ateliers de Constructions Electriques de Jeumont, has registered a South African Company, Jeumont South Africa (Pty), Limited. At the same time a technical agreement has been signed with Harold Marthinusen and Company (Pty), Limited. This company will manufacture products to Jeumont designs. Jeumont produces power station equipment, mine hoists, electrical equipment for steelworks, electric locomotives, and other electrical equipment.

Appeal to the South African Government has been made by Dr. Busschau, president of the Chamber of Mines, to give further attention to suggestions made recently by the Chamber and other organizations to ease tension and improve the position of native workers. There was great concern at the fall in capital values of mining shares, he said, and at the extreme difficulty now realized to raise new capital for exploration and for the development of new mines.

While mining operations had not been affected by the recent native unrest, said Dr. Busschau, the Chamber could not, in view of its responsibility to shareholders in particular and the country as a whole, be blind to the causes and consequences of unrest.

Legislative Council of South West Africa has decided to appoint a commission to investigate possible coal deposits in the territory. Dr. J. W. Brandt said that coal-bearing formations were known to exist in South-West Africa, but were covered by thick layers of sand. Outcrops had been found in Kaoboveld. The Karoo formation existed north of Tsumeb and south of Gobabis, but it was covered by a 600-ft. layer of sand. Below the sand there was a thick layer of coal-bearing formation.

The sea lift of Transvaal coal from Lourenço Marques to the Cape ports has nearly ended. Last of the ships chartered for the purpose by the Railway Administration discharged her final cargo of coal at Port Elizabeth.

A coaling plant for tugs and trawlers is now in operation at the Alfred Basin, West Quay, Table Bay Harbour, Cape Town. It is capable of handling over 100 tons an hour and coaling operations have been speeded up considerably.

South African anthracite is being sent from Durban to France. The motorship Graig will take 8,000 tons at the end of the month at a rate of 57s. 6d. a ton. Another British tramp will be taking a load of coal to Rangoon, in pursuance of a contract recently gained by the Union, and this will go at 46s. 6d. a ton.

The Sarek will take 7,800 tons of manganese ore to Genoa for 51s. 10d. and the Prekla will take 9,500 tons of ilmenite to Spezia. The Western Trader will load 13,000 tons of manganese ore at Lourenço Marques for Trieste at 50s. a ton.

The South African Coal Estates Colliery at Witbank has asked for a commission to be set up without delay to hear the appeal against the closing of five sections of the mine. Mr. W. T. Dalling, inspector of mines, Witbank, gave the order to close. Mr. Dalling's reason for ordering the closure was that coal was being mined across abandoned workings. South African Coal Estates—comprising Navigation and Landau No. 3 mines—had an output of 1,749,914 tons of coal last year.

Following failure of the merger talks with Natal Ammonium Collieries the Natal Anthracite Colliery has invited holders in Dundee Anthracite to accept two Natal shares for every five Dundee shares. The merger would give Natal an aggregate sales quota of 300,000 tons, which it can produce on a single-shift basis. The last 12 months' aggregate output of the two companies was 268,000 tons, but Dundee incurred a loss of £10,000 on its 81,000 tons.

WALLSEND CORPORATION has approved a proposal by Swan, Hunter, & Wigham Richardson, Limited, to reconstruct one of the berths at its Wallsend shipyard.

UK-American Gear Partnership

PARTNERSHIP formed a year ago between David Brown Industries, Limited, Huddersfield, and Foote Bros. Gear & Machine Corporation, of Chicago, has been amplified to provide new distributive arrangements for David Brown gear products in Canada and Western America. A joint statement announces the formation in Toronto of a jointly owned company, David Brown-Foote Gears, Limited, which will take over the sales and distribution in Canada of gear transmission and chain products manufactured by both companies and their associates.

This joint enterprise will enable the UK company's Toronto subsidiary, David Brown (Canada), Limited, to concentrate on marketing David Brown tractors and farm machinery. Mr. E. Percival will continue as general manager of David Brown (Canada) and will also act as a member of the board of David Brown-Foote Gears, of which Mr. Arthur R. Johnson, a former vice-president of Foote Bros., has been appointed vice-president and general manager.

At the same time Foote Bros. Gear & Machine has taken over the gear division of David Brown Incorporated, of San Leandro, California, and will be responsible for the sales and distribution of David Brown gear products in Western US.

British Non-ferrous Metals Federation

THE British Non-Ferrous Metals Federation has elected Mr. W. W. Dolton, managing director of the Delta Metal Company, Limited, and of Copper & Alloys, Limited, Extruded Metals Company, Limited, Heaton & Dugard, Limited, and of Moore Bros. (Birmingham), Limited, president for the ensuing year. Mr. Michael Clapham, joint-managing director of the metals division of Imperial Chemical Industries, Limited, Mr. C. H. M. Holden, chairman of V. J. Copas, Limited, and managing director of Charles Clifford, Limited, and Hall Street Metal Rolling Company, Limited, and Mr. W. F. Slater, director and general manager of Thomas Bolton & Sons, Limited, have been re-elected vice-presidents.

Mr. H. F. Sherbourne, chairman of Anson Units, Limited, managing director of Yorkshire Imperial Metals, Limited, and Yorkshire Copper Works (Holdings), Limited, has been elected a vice-president and Mr. W. F. Brazener, managing director of the Mint, Birmingham, Limited, has been elected treasurer in place of Mr. A. L. Johnson, who has retired.

Rise in Stocks of Raw Materials

THE Board of Trade's revised estimate of stocks held by manufacturers and distributors shows that in the first quarter of the year the increase amounted to £190,000,000, which is £13,000,000 less than was estimated provisionally. The rise in stocks of materials and fuels in the first quarter (£30,000,000) was substantially more than can be accounted for by seasonal changes.

Allowing for seasonal factors, the rise in the volume of manufacturers' stocks, at 1954 prices, was about the same as in the final quarter of 1959.

Cutlers Promote Training Scheme

SCHEME to help men in Sheffield's traditional industries to train for executive positions is being worked out by the Cutlers' Company in Hallamshire (Sheffield) in collaboration with the Cutlers' Company of London. This was announced last week by the Master Cutler, Mr. P. J. C. Bovill, at a Rotary Club luncheon in Sheffield.

The scheme has been promoted with the object of educating and broadening the practical experience of those who show promise of becoming executives, but who would otherwise not have the opportunity of fitting themselves for such a post. An executives' committee has been appointed and will go into the question with firms, who may recommend individuals who must be under 28 years of age and work within the boundaries of the Cutlers' Company in Hallamshire in cutlery or cutting tools.

The London company of Cutlers is to make a biennial award of £200 to enable successful candidates to attend an education centre or train in a factory at home or oversea in products analogous to those of his own firm.

Expansion by Australian Aluminium

PLANS for a further expansion of its rolling mill and extrusion facilities in Sydney have been completed by the Australian Aluminium Company, Limited. Details were announced last week by Aluminium, Limited, and the British Aluminium Company, Limited, joint owners of the Australian concern

The plans are being implemented nearly two years ahead of schedule and they call for an increase of 4,500 long tons per annum in the capacity of the rolling mill and an additional 1,700 long tons of extruded products a year. Cost of the additional facilities is estimated to be about £A1,800,000.

When the programme has been completed in 1963, Australian Aluminium will have the capacity to produce a total of approximately 20,000 long tons of rolled products and 9,000 long tons per annum of extruded products.

Corrosion is Costing £600,000,000 a Year

CORROSION in the UK is costing about £600,000,000 every year and even a slight improvement in preventive measures would represent considerable savings in materials and mapower, according to the annual report of the National Chemical Laboratory. The laboratory is making a series of tests on the corrosion of mild steel ship's plates in estuary waters, and has also completed an investigation of the corrosion of mild steel tubes in "Scotch" marine boilers for the British Shipbuilding Research Association.

The laboratory, reconstituted under its present name in October, 1958, has extended its work on new materials, especially studies of the development of thermally stable materials, for example, organoboron compounds. Considerable improvements have also been made in the ion-exchange process for the recovery of gold from cyanide solutions.

THE COAL TRADE

SUPPLY and demand has contracted correspondingly with the onset of the holiday period and there is unlikely to be much change now in the flow of trade until the approach of the final weeks of summer prices when a minor rush to take last-minute advantage of the concession is now normal. Solid fuels for industry have shown little variation in demand except in a slight upward direction, but even this is bound to fall off in the next month with many works closed down for the holidays.

SOUTH WEST LANCASHIRE

There has been an awakening interest in the purchase of house coals and merchants are receiving rather more orders than they have for some weeks. These have all been delivered very promptly. Although colliery holidays are now taking place there is no difficulty in obtaining full supplies which are readily available. Stocking at the depots has now started and small tonnages are being put on the ground regularly day by day. "Coalite" maintains a steady market with satisfactory deliveries. There has also been an improvement in the delivery of anthracite stove nuts and many merchants are putting this fuel into stock.

The gas coke market continues on very quiet lines. Industrial demand for both gas coke and hard coke, particularly small sized qualities, is satisfactory and deliveries are made promptly. The general industrial demand is also being well maintained and prompt deliveries are made against allocations.

Coastwise trading from the Merseyside docks continues on a very reduced scale. The demand for bunker coals for both foreign and coastal steamers is only slight and is met without difficulty.

The following are average prices per ton of house coals:—Group 1, 182s. 8d.; Group 2, 163s. 3d.; Group 3, 146s. 5d.; Group 4, 134s. 8d.; Group 5, 121s. 7d.; Group 6, 111s. 5d.; Group 7, 97s.

NUM Shares "Gamble" Condemned by Miners

DECISION of the National Union of Mineworkers' executive to join in a three-way £1,000,000 Stock Exchange "gamble" was attacked by Mr. Bert Wynn, secretary of the union's Derbyshire branch last Friday. He said the general investment of trade union funds was "immoral". "By investing in business, we will be leaving ourselves wide open to criticism by the Conservatives, who will undermine our Socialist aims if we help in this way to make capitalism a success."

Derbyshire's 36,000 miners are strongly opposing the formation by three trade unions of a unit trust to buy shares in private firms. The NUM executive, it is understood, has agreed to withdraw from the Co-operative movement £200,000 of union funds to invest in private firms. The other two unions are the General and Municipal Workers' Union and the Union of Shop, Distributive and Allied Workers. A Derbyshire Area resolution condemning the executive action was passed by 37 votes to 10.

Mr. Wynn agreed the national executive was trying to protect the existing value of its funds by investing in ordinary shares, "but we should not invest with a view to profits—we should use it to do something beneficial. The only way to achieve this would be to invest with local authorities or through a political movement."

Coal Stocks Nearing 35,000,000 Tons

UNDISTRIBUTED stocks of coal at collieries are still increasing. In the week ended July 9 they were only 50,000 tons short of 35,000,000 tons, compared with the 29,228,000 tons stocked in the corresponding period of last year. Consumers stocks in the week ended July 9 were over 1,500,000 tons less than in 1959.

There were 597,600 wage-earners on colliery books on July 9, against 658,900 on July 11, 1959, the numbers engaged at the coal face being 227,800 and 256,500 respectively. Total absenteeism (all workers) in the week ended July 9 was 12.94 per cent. compared with 13.31 per cent. in the week ended July 11, 1959. Output at the face was 4.053 tons and overall 1.408 in the week ended July 9, compared with 3.808 and 1.352 tons in the week ended July 11.

The following table gives (in tons) the output of saleable mined coal by division in the week ended July 16, and the tonnage lost through all causes (holidays, disputes, and go-slows):—

Division.	Week ended July 16, 1960.		Week ended July 18, 1959.
	Total output.	Tonnage lost.	Total output.
Scottish	244,000	87,400	271,300
Northern (N&C) ..	186,200	61,300	181,300
Durham	366,800	109,600	362,500
North-Eastern ..	827,000	9,600	862,500
North-Western ..	199,300	56,000	204,800
East Midlands ..	796,300	83,700	843,000
West Midlands ..	295,500	400	330,700
South-Western ..	271,500	121,600	258,800
South-Eastern ..	33,900	—	36,400
Great Britain—			
Deep-mined coal ..	3,210,500	529,600	3,351,300
Other deep-mined (including licensed mines) ..	39,000	—	48,800
Open-cast coal ..	150,300	—	213,000
TOTAL ..	3,399,800	529,600	3,613,100

AT LEAST 32 miners were killed and 32 injured when fire broke out in the Hannoversche Treue No. 1 iron-ore mine in Salzgitter, Lower Saxony, on Tuesday. The fire began in the early hours on a level more than 1,000 ft. below ground when a transformer short-circuited. About 200 men were below and many escaped by crawling through a ventilation shaft to a neighbouring mine. A message of sympathy has been sent to the West German Embassy in London by Sir Joseph Latham, deputy chairman of the NCB.

Coalfield News

North Staffs NUM Agent to Retire

TRIBUTES were paid on Saturday to the work of Mr. W. Jones, agent and president for 12 years of the North Staffordshire District of the National Union of Mineworkers, who is to retire in August when he is 65. Mr. Jones and his wife were the guests of the district at a luncheon in Burslem where he received a presentation and an illuminated address from the Lord Mayor of Stoke-on-Trent, Mr. Gordon Dale.

Mr. Jones began his mining career in Chatterley Whitfield Colliery and has worked at Norton and Sneyd collieries. He has been chairman of the district consultative committee and has also served on the district safety and welfare committees. Replying to the many tributes paid to him Mr. Jones said: "I still believe that the quality of work done is of paramount importance in our negotiations."

A PLAQUE is to be erected by the Thorne (Yorks) branch of the NUM in memory of the late Mr. Alwyn Machen, the Yorkshire miners' leader who died earlier this year.

DEMOLITION CONTRACTORS blew up the 186 ft.-high brick chimney at the now disused Holbrook Colliery, Halfway (Derbyshire), last weekend. The chimney has been a noted local landmark for the past 72 years.

LAST WEEK Easington Colliery (Co. Durham) had its highest output since coal drawing started at the pit 50 years ago. The output of 25,032 tons exceeded the target by 8,032 tons and was 843 tons better than the previous record.

MINERS arriving for work at Bargoed Colliery (Mon) on Monday after their two weeks' holiday were told to go home again. A NCB spokesman said that work on a new electric winder had not been completed. The 800 workers returned to work on Tuesday.

MEMBERS OF THE COUNCIL of the Nottinghamshire Area of the National Union of Mineworkers at a meeting on Saturday reaffirmed their intention to oppose any move to decentralize the mining industry and pledged their full support to any action which the NUM might take to resist it.

SEVERAL OLD BINGS in the East Fife Area of the Scottish Divisional Coal Board are being cleared and the material used for road foundations. A NCB spokesman said that the bings at Wellsgreen, Rosie, and East Wemyss collieries had oxidized and were therefore of use in road making.

SUCCESSOR to Mr. W. H. Jones, who is retiring next month as miners' agent of the North Staffordshire Area of the NUM, has been named as Mr. John Lally, a ripper at Chatterley Whitfield Colliery. Mr. Jones has held the position since the formation of the Midlands Area of the NUM in 1948.

ANNUAL GOLF MATCH of the South Staffordshire, Warwickshire, Worcestershire, and Shropshire branches of the National Association of Colliery Managers was held recently at Tamworth (Staffs). Mr. T. Fowke won the Fenn bowl and an informal dinner for the 28 members and guests was held after the game. The competition was once again organized by Mr. W. A. Machin.

SHIPMENTS of coal and coke from Newcastle-upon-Tyne in the first half of the year, at 2,976,054 tons, show a slight increase of 8,924 tons on the corresponding period of 1959. This was due to increased exports which rose by 75,318 tons to 392,255 tons and offset the fall of 59,137 tons in coastwise cargoes to 2,561,145 tons and a drop of 7,257 tons in bunker shipments to 22,654 tons.

BECAUSE HE COMPETED in the Butlin John O'Groats to Lands' End walk earlier this year, Barry Meeson, a miner at Wolstanton Colliery (Staffs), was disqualified at the North Staffordshire miners' sports at Knypersley on Saturday. Although he did not win a prize Staffordshire AAA officials held that anyone who competed in a race where there was prize money lost his amateur status.

WARSOP URBAN COUNCIL is to recommend the refusal of an application made by the National Coal Board to the planning authorities to be allowed to stockpile coal at a site near Warsop Main Colliery. The council has objected to pit tips in the area for a number of years and, apart from aesthetic objections to the dumps, it fears that they might ignite if left for any length of time.

SURVEY at Parkhouse Colliery (Derbyshire) has shown that one of the seams contains only nine months' reserve of coal. Since the coal has to be hauled 3½ miles to the surface the seam has become uneconomic and negotiations are in progress between the NCB and the NUM over its closure. The board proposes to transfer the 70 miners affected by the closure to the nearby Williamthorpe Colliery, where new seams are being developed.

AUGUST ISSUE of Mining Review—the NCB newsreel—features further developments at the new Lurgi Gas plant in Westfield (Fife) on the gasification of coal. "Cosie," the baby bear mascot of the Coal Utilisation Council, is shown holding the limelight at a charity garden party, and a look at the modernization of collieries at Stoke-on-Trent demonstrates how the city gives the lie to its "Black Country" tag in its Jubilee Year.

New Yorkshire Secretary of NACODS

AFTER he had been declared the new secretary of the Yorkshire Area of the National Association of Colliery Overmen, Deputies and Shotfirers on Saturday, Mr. Laurie Wormald told delegates that he realized that he had won office at a time when the coal industry was going through difficult times. "But we shall endeavour to maintain what we have already achieved and will continue to ask for a fair share of what the industry can give," he said.

Mr. Wormald received 7,023 votes, his nearest rival, Mr. John Goulding, a deputy and branch secretary at Barnbrough, polling 283 votes. Mr. Wormald was in turn a shotfirer, deputy overman, and latterly economy officer at Wombwell Main Colliery, where his father and brother were underofficials. He succeeds Mr. Eric Lockett, who resigned last month to take an appointment with the North-Eastern Divisional Coal Board. In April this year he was elected president of the NACODS.

Members of the Yorkshire Area of NACODS are to be allowed to contract out of the proposed national scheme to give a 10s. 6d. a week pension to members who retired prior to nationalization. The Area council has decided that any underofficials who joined the voluntary scheme should contribute 2d. a week. Mr. Wormald said that for the small number of men in the county who would benefit, the council did not consider it worth taking part in the scheme. The youngest shotfirer in Yorkshire who would benefit would be 73 and the youngest deputy 78.

NEWS IN BRIEF

THE LONDON OFFICE of Padley & Venables, Limited, Sheffield steel and tool makers, has been changed to Clutha House, 10, Storey's Gate, London, S.W.1 (telephone: WHItehall 0678/9).

STEEL PRODUCTION in the US this week is estimated by the American Iron and Steel Institute at 1,556,000 tons, compared with 1,476,000 tons (revised) last week and 365,000 tons in the corresponding week of last year.

DURING THE FIRST five months of 1960 Lorraine-Escaut, the French iron and steel company, has produced 892,600 tons of steel compared with 752,500 tons during the same period in 1959, states its chairman M. Roland.

DEPARTMENTS dealing with the UK instrument sales, instrument service and despatch, and the exports division of the Solartron Electronic Group, Limited, have changed their address to Cox Lane, Chessington, Surrey (telephone: Lower Hook 2150).

TOTAL OF ABOUT 3,200,000 metric tons of rolled steel (excluding refined steel) worth DM 1,500,000,000 was exported last year from west Germany at prices 11 per cent. lower than those for the previous year, and 24.3 per cent. below those recorded in 1957.

SIX-STRAND, 52-in. cold reduction mill is to be constructed by the United States Steel Corporation at the Fairfield, Alabama, tin mill of its Tennessee coal and iron division. The mill is expected to begin rolling steel for can-making tinplate early in 1962.

HOWDON STAITH on the north bank of the River Tyne is to be closed because of the slump in the port's coal trade. When the staith is closed—which is not expected for some weeks—double-shift working will be resumed on No. 5 staith, Whitehill Point.

RESTRICTIVE PRACTICES COURT is to hear an application in the matter of an agreement between certain manufacturers of wire nails on March 6, 1961. An application on behalf of the manufacturers to have the hearing postponed until after Easter was rejected.

THE LIBERIAN ORE CARRIER Ore Prince arrived at the ore quay, Tyne Dock, last Friday from Puerto Ordaz, Venezuela, with 30,865 tons of iron ore, a record for the UK. Previous biggest cargo was one of 30,640 tons brought to the ore quay last year by the Ore Regent.

INTRODUCTION of two further coal-fired power stations in the West Riding coalfield should be encouraged by the county council, states the Planning Committee of the council. The committee is to investigate six areas in the county for their suitability for such power stations.

ENGINEERS of Cementation Company (Rhodesia), Limited, a member of the Cementation Group, have sunk and lined 451 ft. of the new shaft No. 14 at Mufulira mine, Northern Rhodesia, in one month and have thus broken the company's own record for shaft sinking in the Copper Belt.

PUBLIC INQUIRY has been ordered by the Secretary of State for Scotland into proposals recently put forward by the Associated Portland Cement Manufacturers, Limited, to East Lothian County Council for open-cast lime mining at Oxwell Mains, Dunbar, at an estimated cost of between £4,000,000 and £5,000,000.

FOR THE TIME BEING the Government's Export Credits Guarantee Department has suspended cover on new business with the Congo Republic in view of the present disturbances. Policyholders remain covered on existing business. Those with "contracts" type policies are covered on all contracts already placed, whether goods have been shipped or not, and those with "shipments" type policies are covered on all shipments already made.

MEMBERS OF THE miners' union at Omuta, Japan, who have been on strike for eight months, built barbed-wire barricades and dug trenches round collieries to hold off the police, last weekend. The union members have been called on to "fight to the end" any police attempt to enforce a court order against picketing the mine.

PAY CLAIM FOR about 100,000 engineering apprentices was settled in negotiations in London on Wednesday. All the boys are to receive increases, effective from Monday, July 25, ranging from 3s. 10d. a week at 15, to 17s. a week at 20. The increases will be added to the apprentices' supplementary payments and do not affect the system of calculating their basic rates.

BECAUSE it has now "outgrown its name" the Witton Moulded Insulation Works of the General Electric Company, Limited, Birmingham, has been renamed GEC Moulded Plastics Division. The Witton works has long outgrown its original purpose of moulding insulating components and now manufactures everything from radio cabinets to vacuum jugs and nylon football studs.

COAL DEPOSITS in Sanchez Province, Dominican Republic, are being examined by the Government's minerals commission. It is stated that several hundred tons of coal have been extracted and successfully used as fuel for locomotives and sugar mills. Preliminary work is being carried out to assess the extent of deposits to decide on the practicality of large scale commercial exploitation.

EXPERIMENTS on the extraction of wax from Shetland peat are being carried out by Mr. A. E. Lance, a mining surveyor. Some years ago he founded the Shetland Peat & Ore Development Company, Limited, which made peat briquettes. The process was uneconomical, however, and the factory closed. He is also working on a method of economically extracting iron ore from the magnetic sand deposits on the island.

NEW COMPANY is to be formed by Benjamin Electric, Limited, London, N.17, in conjunction with Bradley Bros., Limited, distributors of motor parts, of Sydney, Australia, to engage in the manufacture and wholesale distribution of Benjamin electric lighting equipment. The new company, Benjamin-Bradley Electric Proprietary, Limited, will also take over the manufacturing activities of Bradleys Electrical Industries Proprietary, Limited.

PARTY OF MEMBERS of the British Institute of Vitreous Enamellers who should have arrived in Moscow on Wednesday had a last-minute notice of postponement by the Russian Embassy in London because many of the plants and factories which were to have been visited were on holiday. An official of BIVE commented that it was the third time the Russians had made last-minute changes.

STEEL CONSTRUCTION and machine-building company bearing the name Utkal Machinery Private, Limited, has been formed in Bombay by the Indian concern of Larsen and Toubro, Limited, Bombay, and the west German companies Gutehoffnungshütte Sterkrade, AG, Heinrich Koppers, GmbH, and J. M. Voith, GmoH. The company has a capital of Rs 12,500,000, of which 25 per cent. is held by each founder and is to build

a plant near the Rourkela steelworks in the Indian state of Orissa.

ONCE AGAIN the English Electric Company, Limited, has underbid domestic US competitors—this time for two propeller-type turbines for the projected Melton Hill Dam, Tennessee. English Electric's bid of $1,730,070 (£617,878) compared with the next lowest bid of $1,829,300 (£653,326) by a US firm which would manufacture the turbines in Germany. Lowest wholly US tender was $1,848,389 (£660,232) submitted by Baldwin-Lima-Hamilton Corporation.

THIOCETAMIDE, now widely used as a sulfide precipitant can now be supplied by its makers, the J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, through J. T. Baker's exclusive distributors in the UK, Omni (London), Limited, 35, Dover Street, London, W.1. Thiocetamide is used in the detection and determination of heavy metals in a number of materials, in the resolution of alloys and ores, and in schemes for the separation and identification of common cations.

In Parliament

CARDIFF COAL SHORTAGE

COMPLAINTS by consumers and merchants in Cardiff about the failure to secure adequate supplies of coal during the winter of 1959 were referred to by MR. JAMES CALLAGHAN (Lab.), who asked the MINISTER OF POWER, Mr. Richard Wood, if he would take the matter up with the Domestic Coal Consumers' Council so as to prevent a repetition this winter.

MR. WOOD said that in co-operation with the distributive trade, the National Coal Board was taking steps to prevent last winter's difficulties being repeated.

DEPUTY CHAIRMEN FOR NCB

TWO deputy chairmen will be appointed to the National Coal Board on October 1 this year, but it will be for the chairman to settle their respective duties, said the MINISTER OF POWER, Mr. Richard Wood.

MR. ALBERT ROBERTS (Lab.) had asked that one deputy chairman should be made responsible for the commercial side of the coal industry, and the other for the production side.

COAL BY-PRODUCTS REPORT

REPORT of the Wilson Committee on research and development on processes for producing chemicals, gas, and oil from coal was being printed, said the MINISTER OF POWER, Mr. Richard Wood, and he added that he hoped to be able to publish it in early August.

He told DR. REGINALD BENNETT (Con.) that a further statement would be made when he had studied the report and received the views of interested parties.

ASKED BY Mr. A. ROBERTS if he would direct the National Coal Board to develop a scheme to stimulate recruitment of labour into the mines, the Minister of Power said the Board was already taking steps to improve recruitment where needed.

AN ORDER WAS being drafted to give effect to the recommendations of the standing committee on the marketing of certain hand tools, and he hoped to lay it before Parliament at the beginning of next session, the President of the Board of Trade stated in a written answer to Mr. George Darling (Lab. & Co-op.).

Board Changes

New Boards for David Brown

RE-FORMING of the product groups of the David Brown Corporation, Limited, has now been completed and the directors of the two groups have been appointed. The board of DAVID BROWN TRACTORS, LIMITED, which is the parent company of the tractor and agricultural machinery group, is headed by Mr. David Brown as chairman and joint managing director. Mr. David Brown, Jnr., is also joint managing director with Mr. J. Thompson as general manager, Mr. L. V. Gallagher as manufacturing director, and Mr. J. D. Elstone as marketing director.

Mr. David Brown is also chairman and managing director of ASTON MARTIN LAGONDA, LIMITED, the parent company of the automobile group, with Mr. J. Wyer as general manager, and Mr. David Brown junior, Mr. Thompson, and Mr. J. Stirling as directors.

REID GEAR COMPANY, LIMITED—Mr. A. Hynd has joined the board.

K. L. HOLDINGS, LIMITED—Mr. P. Shand Kydd and Mr. F. K. Sugden have joined the board.

CONTRACTOR SWITCHGEAR, LIMITED—Mr. K. N. Swash and Mr. M. A. Slater have joined the board.

SANDERSON KAYSER, LIMITED—Mr. L. A. K. Halcomb, Mr. H. Baron, and Mr. A. B. Heeley have joined the board.

YALE & TOWNE MANUFACTURING COMPANY—Mr. Gordon Patterson, the Detroit industrialist, has been elected a director and president of the company.

A. W. CHAPMAN, LIMITED—Mr. W. A. Wood and Mr. R. L. Harrison have joined the board of the company, which is a subsidiary of Constructors, Limited.

ROADLESS TRACTION, LIMITED—Mr. Godfrey E. Liardet, chairman and managing director of Simms Motor & Electronic Corporation, Limited, has been appointed a director.

DOWTY GROUP, LIMITED—Mr. Lionel Harper, managing director of the subsidiary Dowty Hydraulic Units, Limited, has joined the board of Coventry Precision, Limited, another subsidiary.

BIRMINGHAM SMALL ARMS COMPANY, LIMITED—Mr. Arthur J. Burton, who resigned in May as director of manufacture of the British Motor Corporation, Limited, is to join the board on August 1 as director of manufacturing services.

G. A. HARVEY & COMPANY (LONDON), LIMITED—Sir Thomas Overy has resigned the chairmanship on medical advice, but remains a director of the company. Mr. D. A. F. Donald, chairman and managing director of the National Cash Register Company, Limited, has been appointed to succeed him.

JOHN FOWLER & COMPANY (LEEDS), LIMITED—Mr. Peter Martin, general manager of the Doncaster foundry, has been appointed to the board. He joined the company as chief engineer in 1949, taking up his present post three years ago. He is a past chairman of the Sheffield branch of the Institute of Plant Engineers.

ROLLS-ROYCE, LIMITED—Maximum number of directors on the board is to be increased from 12 to 15. Lord Kindersley, the chairman, told shareholders the appointments would be made as the need arose. Mr. D. P. Huddie, one of the company's leading designers, who is already a director of the aero-engine division, and general manager, sales and service, was elected to one of the additional seats.

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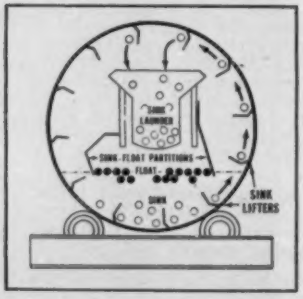

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COMPANY NEWS

RATCLIFFES SPRINGS, LIMITED—A one-for-four scrip issue is proposed after which the increased capital of 3,750,000 1s. shares is to be consolidated into 750,000 shares of 5s. each.

CLIFFORD MOTOR COMPONENTS, LIMITED—Final dividend of 20 per cent. makes 25 (equivalent of 18¼) per cent. for the year ended March 31, 1960, but the capital distribution, not subject to tax, is halved to 2½ per cent.

UNIVERSAL ASBESTOS MANUFACTURING COMPANY, LIMITED—It has been found necessary for administrative reasons to change the qualification date of the proposed one-for-one scrip issue from September 1 to July 26.

LODGE PLUGS, LIMITED—Final dividend of 12½ per cent. and a bonus of 2½ per cent. makes 20 per cent. for the year to April 1, 1960, against a single payment of 15 per cent. previously. Group net profit increased to £95,680 (£39,916).

ACROW (ENGINEERS), LIMITED—Third quarterly payment makes, with the previous 12 per cent. payments, 35 per cent. to date in respect of the year to March 31, 1960. A total equivalent to 37$\frac{7}{16}$ per cent. for the full year was paid in 1958-59.

ABWOOD MACHINE TOOLS, LIMITED—Final dividend of 7½ per cent. makes 12½ per cent. for the year ended March 31, 1960, compared with a single payment of 7½ per cent. for the previous year. Net profit rose from £4,860 to £11,993, after tax of £10,918 (£3,956).

SUTCLIFFE, SPEAKMAN & COMPANY, LIMITED, manufacturers of brick and briquetting machines, etc., of Leigh (Lancs)—Final dividend of 12½ per cent. makes 17½ (15) per cent. for the year ended March 31, 1960. Group net profit rose from £55,089 to £79,742, after tax of £71,056 (£53,313).

BERRY'S ELECTRIC MAGICOAL, LIMITED—Final dividend of 23½ per cent. makes 30 per cent. for the year ended March 31, 1960, on capital increased by a 50 per cent. scrip issue. This compares with a total equivalent to 13½ per cent. for 1958-59, and with a forecast of not less than 20 per cent.

SYMONDS ENGINEERING COMPANY, LIMITED—The present state of the order-book is very satisfactory, indicating a further year of good results, states the chairman, Mr. D. Symonds. Profit for the year ended March 31, 1960, before tax, was £94,611 (£80,634) and the ordinary dividend is 27½ per cent.

MANLOVE, ALLIOTT & COMPANY, LIMITED, general manufacturing engineers, of Nottingham—Net profit for the 15 months to March 31, 1960, was £37,509, compared with £21,365 for the previous year, after tax of £17,481 (£14,871). An ordinary dividend of 25 (11) per cent. is to be paid for the period.

LAPORTE INDUSTRIES, LIMITED—To finance the cost of acquiring the preference and ordinary shares of Peter Spence & Sons, Limited, chemical manufacturers, of London, W.1 (about £2,600,000), £2,627,280 10s. ordinary shares at 21s. each are to be issued on a one-for-eight basis to holders of July 1.

WILKINS & MITCHELL, LIMITED, makers of tools, power presses, etc., of Wednesbury (Staffs)—The dividend is being increased from the equivalent of 13.6 per cent. to 21 per cent. for the year to March, 31, 1960, with a final of 14 per cent. Group profit, before tax, expanded sharply to £1,087,108 (£619,254).

TUNNEL PORTLAND CEMENT COMPANY, LIMITED—Final dividend of 11½ per cent. makes 15 (12) per cent. for the year ended March 31, 1960, in addition to which the special cash distribution of 1 per cent., not subject to tax, is being repeated. Group net profit was £1,477,577 (£1,199,016), after tax of £1,173,387 (£1,025,131).

BENJAMIN PRIEST & SONS, LIMITED, bolt and nut manufacturers, etc., of Old Hill (Staffs)—Dividend of 13¾ per cent. for the year ended March 31, 1960, compares with not less than 11¼ per cent. forecast when the shares were offered for sale in July, 1959. Group net profit was £56,807 (£45,407), after tax of £45,800 (£38,500).

PARMITER, HOPE & SUGDEN, LIMITED, manufacturing electrical engineers, of Manchester—Group net profits further declined to £8,570 (£17,443) in the year ended March 31, 1960, and the dividend is cut by 7½ per cent. to 12½ per cent., with a final of 5 per cent. Last year the final was reduced from 22½ per cent. to 12½ per cent.

WATSON, LAIDLAW & COMPANY, LIMITED, iron-founders, sugar and laundry machinery manufacturers, of Glasgow—The chairman, Mr. R. W. Lamont, reports a major scheme of reorganization entailing changes in lay-out of works, etc. The foundry has been closed down as being uneconomic. A system of payment by results has been introduced.

ERF (HOLDINGS), LIMITED, manufacturers of heavy oil-engined vehicles, of Sandbach (Ches)—Dividend is being raised by 5 per cent. to 25 per cent. for the year to March 31, 1960, and the company proposes to capitalize £150,000 of reserves in a three-for-five scrip issue.

MOTOR RAIL, LIMITED, manufacturers of light railway locomotives and dumpers, of Bedford—A group loss of £6,423, before tax, was incurred during the year ended March 20, 1960, compared with a profit of £24,360. The dividend on the £250,000 one-class capital is to be passed. In the previous year the dividend was cut from 7 to 5 per cent.

EDWARDS HIGH VACUUM, LIMITED, manufacturers of vacuum pumps, gauges, etc., of Crawley (Sussex)—It is proposed to convert the outstanding £11,189 loan stock into ordinary 4s. shares on the basis of 21 shares for each £10 of loan stock. Holders not wishing to convert will be paid off in cash on August 31 at a premium of 1 per cent. with interest accrued to that date.

ALBERT HERBERT, LIMITED, machine-tool makers, of Coventry—Interim payment for the year ending October 31, 1960 is raised from 2 to 2½ per cent., tax free, but the directors warn that this should not be taken as implying an increased total for the full year. The 1958-59 final dividend of 5 per cent., tax free, was accompanied by a ½ per cent. net capital distribution.

MIDLAND METAL SPINNING COMPANY, LIMITED—In conjunction with the Aluminium Company of New Zealand, Limited, a new company, Tower Aluminium Company, Limited, has been formed for aluminium manufacturing and marketing in New Zealand. Midland Metal holds 750 £1 shares of the £1,000 capital, the New Zealand company 125 shares, and the remaining 125 shares are held by H. M. Fogarty, Limited, which holds the local agency for Midland Metal.

SHELVOKE & DREWRY, LIMITED, engineers and makers of special purpose vehicles, etc., of Letchworth (Herts)—The number of machines ordered in the seven months

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to May 31, 1960, was 30 per cent. higher than in the corresponding period of last year. The larger output calls for additional floor space and, since it is impossible to extend the present premises, negotiations are now proceeding which will provide additional space "on very favourable terms" and without involving heavy capital expenditure, state the directors.

JOHN HARPER & COMPANY, LIMITED, ironfounders and domestic hardware manufacturers, Willenhall (Staffs)—An electric radiator has been developed—the company's first electrical product—and production will start in time for the autumn selling season. An agreement has been concluded with Hermann Forster, SA, of Switzerland, for exclusive selling rights of its refrigerators in the UK. Group profit was £227,486 (£226,866) before tax of £89,247 (£88,319) and the dividend is 10 per cent. (same equivalent).

W. H. DORMAN & COMPANY, LIMITED, makers of diesel engines and generating sets, of Stafford—Increasing world demand for the engines produced by the firm has overtaken manufacturing capacity in some departments, says Mr. Darby Haddon, chairman. Production difficulties, and not the order-book, is the present limiting factor. The affairs of the subsidiary, W. G. Bagnall, Limited, were reorganized during the year, and Mr. Haddon hopes by next year to be able to say that the sources of its prosperity are as firmly based as those of the parent are now.

W. P. BUTTERFIELD, LIMITED, manufacturers of transport and oil storage tanks, etc., of Shipley (Yorks)—Final dividend of 10 per cent. makes 15 per cent. for the year ended March 31, 1960, on capital increased by the issue of shares against the acquisition of Bradley & Company, Limited. This compares with the forecast of a maintained total of 10 per cent. Group net profit, including profits of the subsidiaries from August 12, 1959, was £157,256, after tax of £126,748. On the basis of a full year's profit from the subsidiaries, the next figure would have been £214,891, after tax of £171,407.

SIR WILLIAM ARROL & COMPANY, LIMITED, bridge-builders, structural and mechanical engineers, of Glasgow—A one-for-one scrip issue and a capital profit distribution of 1s. per £1 ordinary share are to be made to holders on August 8. It is also proposed to modify the voting rights of the 7 per cent. cumulative £1 preference shares to conform to modern practice. As compensation for certain restrictions of voting rights thus involved a one-for-eight scrip issue is to be made to holders of August 8. Early in September the board intends to declare a 5 per cent. interim dividend for 1960 on the increased ordinary capital.

Iron & Steel Institute's New Medal for Royal Society

COUNCIL of the Iron & Steel Institute has established a new gold medal award, to be known as "The Medal of the Iron & Steel Institute." The medal is to be presented on special occasions to societies which have, in the opinion of the council of the institute, rendered exceptional service to science or industry over a lengthy period.

The first award of the medal has been made to the Royal Society, in recognition of its unique service to science over a period of 300 years. The medal was presented by Mr. R. G. Lyttelton, a past-president of the Iron & Steel Institute, at the tercentenary celebrations of the Royal Society on Monday.

Obituary

MR. PHILIP RABONE

THE death has occurred of Mr. Philip Rabone, who since 1957 was responsible for all technical literature relating to the mining field issued by the engineering group of the General Electric Company, Limited. He was 70. Mr. Rabone was educated at Highgate School and the Royal School of Mines, London, where he took a degree in metallurgy. After the first World War, he spent 15 years in the practice of mineral dressing, concentrating on froth flotation, and he published a work on the subject, Flotation Plant Practice, in 1932.

Mr. Rabone joined GEC in 1935 to take charge of the mineral dressing laboratory at Wembley, leaving in 1947 to join the Government metallurgical laboratory in Johannesburg, where he developed a method for processing uranium. He rejoined the GEC engineering group 10 years later.

He was a member of the council of the Institution of Mining and Metallurgy in 1946-47, and in 1958 was elected a Fellow of the Imperial College of Science and Technology.

The death has occurred of Mr. GEORGE ALLEN RICHARDS, a mining and explosives engineer and a director of Walker Richards Explosives, Limited, Birmingham. He was 39.

The death occurred last week of Mr. HUGH COWAN-DOUGLAS at the age of 64. He was chairman of Glenfield & Kennedy, Limited, Harland Engineering Company, Limited, and of Blackett, Hutton & Company, Limited. Among the many boards of which he was a director were Carntyne Steel Castings, Limited, North British Locomotive Company, Limited, and Alley & Maclellan, Limited.

Manager of No. 1 Group of the South Staffordshire and Shropshire Area of the West Midlands Divisional Coal Board, Mr. HARRY FORD, has died at the age of 51. He began his career as a boy haulage hand at West Cannock Colliery (Staffs) and later qualified as a colliery manager. He was made manager of West Cannock No. 1 and from 1945-53 was manager of West Cannock No. 5. After a further course of training Mr. Ford held an appointment under the Cannock Chase Area general manager and specialized on improvements in the local coalfields. In 1954 he became agent and manager of Hampstead Colliery. Mr. Ford had been a member of the National Association of Colliery Managers for many years.

Czech Invitation to Miners from Arrael Griffin Colliery

AT the invitation of the Trades Union of Mineworkers of Czechoslovakia, 15 miners from the Arrael Griffin Colliery, Six Bells, Abertillery, including three who were injured in the recent explosion, will stay at a miners' rest home in Czechoslovakia during the last two weeks of August. The Czechs are to bear all expenses as soon as the party arrives but the colliery lodge will have to find the money to get there.

The Six Bells Colliery Disaster Fund had by Wednesday evening, reached a total of £49,053.